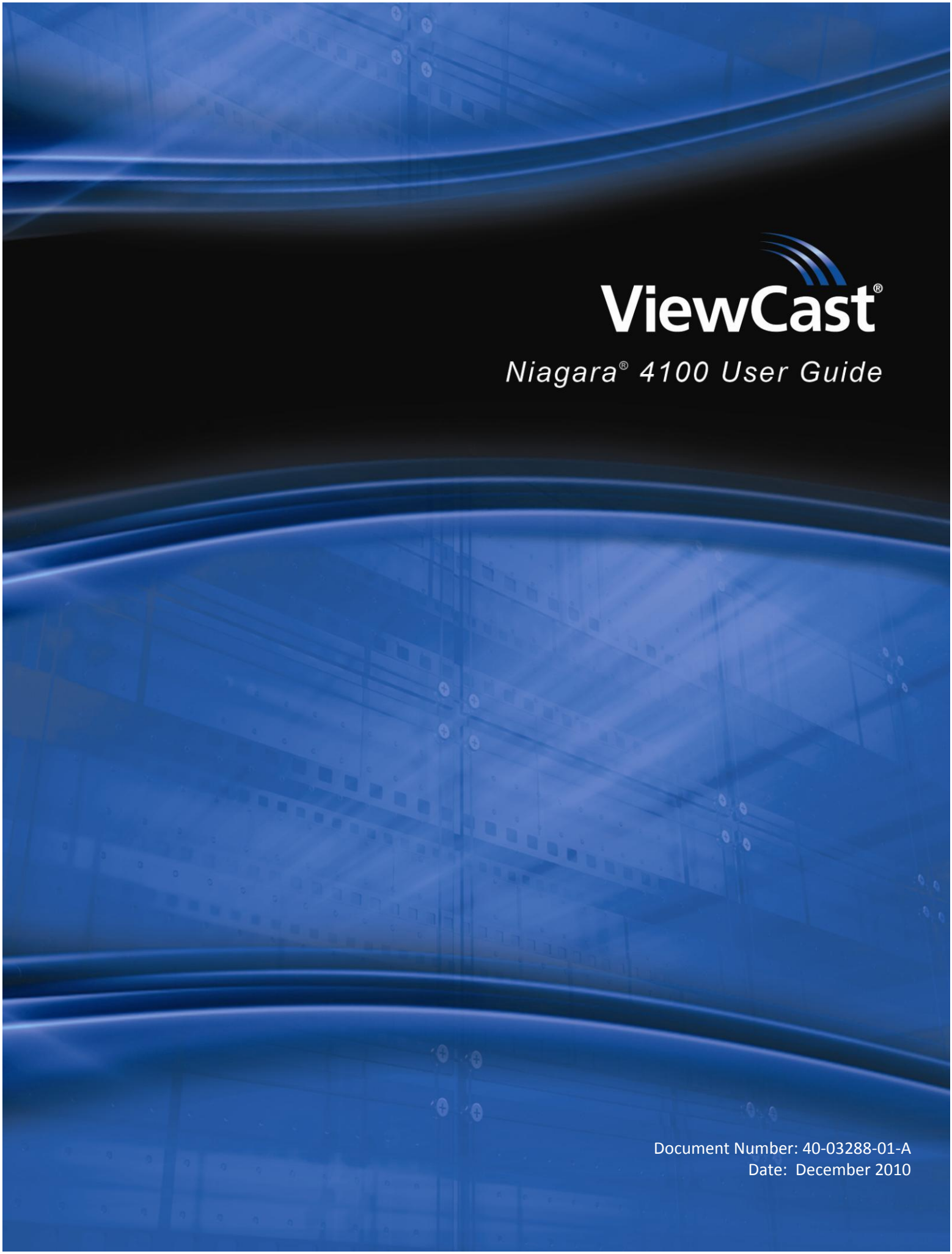

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Warranties

For complete warranty details, refer to the specific warranty included with each product. General warranty information includes the following:

Limited Warranty: ViewCast warrants its hardware products against defects in material and workmanship under normal use for the period of one year (12 months) from date of sale. Where specific warranties exist that provide more substantial coverage, notwithstanding the warranty provisions herein, such product warranties control and preempt or supersede the warranty provisions herein.

Reseller Pass Through of Standard Limited Warranties: Resellers pass the ViewCast standard limited warranties for the products through to the customer without modification. Any modification of a product voids the ViewCast warranties or any other existing or available warranty.

Corporate Contact Information

ViewCast collaborates and partners with various clients to integrate products into their individual environments.

Niagara Technical Support: Phone: 972.488.7157, Fax: 972.488.7111 or submit the technical support online request from the ViewCast website.

ViewCast USA Support: Monday through Friday: 9 a.m. – 5 p.m. Central Time. Typical response time is within one business day for customers without a Priority Support Agreement.

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Toll Free (U.S. only): 800.540.4119 website: www.viewcast.com

Contents

About This Guide

Thank you for purchasing the ViewCast Niagara 4100 streaming media appliance. This user guide provides step-by-step instructions for installing and using your new streaming media appliance. For the latest ViewCast product information and news, visit our website at www.viewcast.com.

Product description

The Niagara 4100 is designed with a combination of simplicity, portability and power to quickly and easily stream your high-definition (HD) content to broadband and mobile networks including live Adapative streaming to Adobe® Flash Media Server and Apple® (iPhones® and iPads®), Adobe Flash® H.264, MPEG-4, H.263, H.264, and Windows Media (Silverlight® compatible) SD and HD, as well as container support for 3GPP and 3GPP2. With the ability to ingest HD video, the Niagara 4100 is ideal for live sports, live newsgathering, webcasting or any streaming application where you need rock-solid HD performance on the go.

This rugged, portable streaming appliance can ingest standard- or high-definition video sources through its SDI input, and accommodates a variety of audio input formats, including embedded SDI, AES/EBU, and balanced or unbalanced stereo.

Figure 1. ViewCast Niagara 4100

Audience

The audience for this publication includes anyone who uses or administers the Niagara 4100. They should have a basic technical understanding of streaming media. This user guide provides information on the Niagara 4100 only.

Conventions for this guide

This guide uses the document conventions specified below to help you identify different types of information.

Convention	Description	Example
Bold text	Characters to enter when referenced in a procedure. The name of fields or keys to press.	Enter **DTMF** as the group type. Press **Enter** to save all your changes.
Note:	Provides supplemental information.	*Note: The prompt may not display if …*
IMPORTANT!	Provides important data that affects how the system or software responds.	*IMPORTANT! You must install Niagara SCX prior to configuring SCX options…*
CAUTION!	Provides information to help avoid possible damage to hardware or a system crash (without data loss).	*CAUTION! Use case sensitive commands to keep from destroying…*
WARNING!	Provides information to ensure you avoid potential injury, death, or permanent system damage.	*WARNING! Do not touch exposed wires.*

Rack mount safety instructions

Operating Temperature	The operating ambient temperature of a rack environment may be greater than room ambient if installed in a closed or multi-unit rack assembly. Therefore, you should install the equipment in an environment compatible with the maximum ambient temperature of 40° C.
Reduced Air Flow	You must not compromise the airflow required for safe equipment operation when you install the equipment in a rack.
Mechanical Loading	Mounting of the equipment in the rack should be such that you do not cause a hazard due to uneven mechanical loading.
Circuit Overloading	Consider the connection of the equipment to the supply circuit and the effect that the overloading of the circuits might have on current protection and supply wiring. You must also consider and use the equipment nameplate ratings when you address this concern.
Reliable Earthing	You must maintain reliable earthing of rack-mounted equipment. Pay particular attention to supply connections other than direct connections to the branch circuit (such as using power strips).

FCC notice

WARNING! You must connect this device and peripherals using shielded cables to comply with FCC radio emission limits.

WARNING! Modifications to this device not approved by ViewCast Corporation could void the FCC-granted authority for you to operate the device.

WARNING! The Niagara 4100 complies with the limits for a Class A digital device pursuant to Part 15 of the FCC Rules. These limits provide reasonable protection against harmful interference when you operate the equipment in a commercial environment. This equipment generates, uses, and may radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area will likely cause harmful interference. In this case you must correct the interference at your own expense.

To CATV Installer: Pay special attention to Section 820-40 of the NEC that provides guidelines for proper grounding. It particularly specifies that you must connect the cable ground to the grounding system of the building as close to the point of cable entry as practical.

WARNING! Equipment installation must comply with local and national electrical codes.

Environmental notices

Product Disposal Information:

Dispose of this product in accordance with local and national disposal regulations (if any) including those regulations governing the recovery and recycling of Waste Electrical and Electronic Equipment (WEEE).

RoHS Compliant:

ViewCast Corporation commits to compliance with the European directive on the Restriction of the Use of Certain Hazardous Substances in Electrical and Electronic Equipment, Directive 2002/95/EC, the RoHS directive.

This product supplied to the European Union does comply with the RoHS directive. ViewCast certifies that this equipment shipped to the European Union conforms to the 2002/95/EC directive.

For current RoHS statement, see www.viewcast.com**.**

Underwriters Laboratories Inc. Statement

Underwriters Laboratories Inc. has not tested the performance or reliability of the security or signaling aspects of this product. UL only tested for fire, shock, and casualty hazards as outlined in UL's Standard for Safety UL 60950-1. UL Certification does not cover the performance or reliability of the security or signaling aspects of this product.

UL does not represent, warranty, or certify the performance of reliability of any security or signaling related functions of this product.

Warnings

Only trained and qualified personnel should install, replace, or service this equipment.

Do not attempt to open the case of the appliance. If you do, you incur a high risk of electrical shock that may cause damage to the appliance or personal physical injury or death to you and/or others. No user-serviceable parts exist inside the appliance. If you open the appliance case or make unauthorized changes to the case, ViewCast voids your warranty.

Install the appliance away from any heat sources. This remains vital to the safety of the product users. Do not install the appliance near any heat sources such as:

- Radiators
- Heat registers
- Stoves
- Other heat-producing equipment

WARNING! Installing the appliance near heat sources could result in personal injury or death.

Never insert objects of any kind into the appliance through any appliance openings, as the objects may touch dangerous voltage points, short out parts, and result in a risk of fire or electrical shock.

Do not stack the appliance atop or below other electronic devices as this can cause heat build-up and vibration of the appliance. These conditions can damage the appliance thereby voiding the limited warranty.

You may stack multiple Niagara 4100 units as these appliances accommodate stacking.

Do not install the appliance in any area where the temperature is less than 5°C or more than 40°C. Transfer from temperature extremes may cause condensation. Let the appliance remain unplugged at room temperature for at least 45 minutes before connecting it.

Use an outlet with surge suppression or ground fault protection when using the appliance. Unplug the power cord from the wall outlet and disconnect the lines between the appliance and the video source for added protection:

- During a lightning storm
- During dangerous weather conditions
- When the encoder remains unattended or unused for long periods

Reduce the risk of fire or electric shock. Do *not* expose the appliance to any rain or moisture. Exposing the appliance to rain or other types of moisture could result in appliance damages. Do not place any liquids on or near the appliance. If you place liquids in any form on or near the appliance, do so at your own risk, for you incur a high risk of electrical shock that could occur and cause damage to the appliance.

WARNING! Exposing the appliance to rain or other types of moisture could result in physical injury or death. Any liquids on or near the appliance may result in electrical shock and personal injury or death.

Refer all servicing to authorized service personnel. You must have authorized personnel only service any damaged appliance. Relevant damage may occur with but is not limited to the following:

- An unplugged or damaged power supply cord
- Spilled liquid on the appliance
- Fallen objects in or on the appliance
- Appliance exposure to rain or other moisture or liquid
- Failure to perform as described in the User Guide
- A dropped appliance

ViewCast assumes no liability or responsibility for any damaged appliance that clients continue using.

Use only attachments, accessories, or equipment specified by the manufacturer with the appliance. Using accessories or attachments not recommended by the encoder manufacturer voids the Limited Warranty.

WARNING! When using 4-pin XLR to cigarette car plug cables, do not disconnect the car battery adaptor or turn off the car engine before you turn off the player. Doing so may damage the player.

Do not attempt to service the appliance yourself. If you open or remove covers, you may be exposed to dangerous voltage. Such action voids the Limited Warranty. Refer all servicing issues to authorized service personnel only.

The plug-socket combination that serves as the main disconnecting device must be accessible at all times.

Protect the power cord from anyone walking on it and being strained or pinched particularly at plugs, electrical receptacles, and the point where the power cord exits the appliance.

Do not use adapter plugs or remove the grounding prong from the power cable.

Use only the type of power source indicated on the marking label on the back panel of the unit to operate the appliance. Unplug the appliance power cord by gripping the plug and removing it from the power source. Do not pull the cord to remove the power source from the appliance.

Do not plug the appliance into a wall outlet that contains an overload of electrical cords or power strips/extension cords. This type of overload may result in fire or electrical shock risks.

Always handle the appliance carefully. Always avoid excessive shock and vibration to the appliance. Excessive shock or vibration can damage the appliance.

WARNING! Excessive shock or vibration to the appliance may result in electrical shock and personal injury or death.

Overview

Before you can use your Niagara 4100 streaming media appliance, you first need to set up and configure it. This chapter is dedicated to providing you with the details and step-by-step instructions you need to make your installation as quick and easy as possible.

All you need to get started are the four following requirements:

- AC power source (100 - 240 V)
- Your audio and video source (such as a camera, video player, or other A/V output device)
- A streaming media server or hosting provider
- IP connection and/or Internet connection

The Niagara 4100, an easy-to-use streaming device, allows you to:

- Connect to a compatible browser on a dynamic host configuration protocol/domain name server (DHCP/DNS) network.
- Configure and connect your audio and video source to the Niagara 4100.
- Select your output formats and streaming settings.
- Enter your streaming server information.
- Start streaming your media.

You can configure and use the Niagara 4100 straight from the box for any streaming activities. Use the web interface for setting options and controlling your Niagara 4100 from another networked computer, as well as more advanced options.

WARNING! Read the installation instructions before connecting the system to the power source.

Media appliance functions

Although it has many features and capabilities, the Niagara 4100 streaming media appliance performs, in its most basic functions, as follows:

- Takes analog audio and SDI video inputs
- Captures the signals
- Encodes the signals into digital IP video formats
- Delivers the IP audio and video content to a storage device or streams it over an IP network

Install overview

This section addresses the high-level actions you must perform to physically connect and set up your Niagara 4100 system.

You must complete the following primary tasks to install the Niagara 4100:

- Address and comply with all prerequisites.
- Connect the Niagara 4100 streaming media appliance using its power source.
- Connect the video source (camera or video recorder) to the system.
- Connect the Niagara 4100 to an IP network.
- Configure the Niagara 4100 system.

Prerequisites

Before installing and connecting the Niagara 4100, ensure you comply with the following prerequisites:

- All packaged items are undamaged and in working order.
- Your environment meets all system requirements.
- Safety instructions, notices, and warnings detailed in *About This Guide* including:
  - *Rack Mount Safety Instructions*
  - *FCC Notice*
  - *Environmental Notices*
  - *Warnings*

Package contents

Completely unpack all contents from the box and inspect each item for damage. Ensure that you have all the components listed below:

Appliance	• Niagara 4100

Power Cables	• One of the following:
	  ○ *North America power cable (110 vac)*
	  ○ *International power cable (220 vac)*
	  ○ *UK power cable (220 vac)*
	• AC to DC converter

Guides	• Package insert (end-user license agreement, welcome letter, package content list) • User guide (on CD in PDF format) • Quick Start Guide
Software	• 1 Niagara 4100 CD
Hardware	• Rugged carrying case

If any components are missing or damaged, do not continue with the installation. Contact the ViewCast reseller from which you purchased your Niagara 4100 streaming media appliance for assistance in obtaining any missing parts or for parts replacement.

System requirements

Ensure your computer meets the following system requirements.

Browser Interface	Any Internet Explorer (IE)-based computer, workstation, or laptop that interfaces to a dynamic host configuration protocol/domain name server (DHCP/DNS)-compatible network
User Interface	High-speed Internet, dial-up, and mobile device users

Specifications

- Intel i7 processor
- 4 GB RAM or larger
- HDD (160 GB or larger)
- Osprey 710e HD technology
- 4.5” H x 8” W x 12” D)
- 8 lbs (3.6 kg)
- 90 W power supply

Installing additional software

The Niagara appliances run an embedded version of the Microsoft Windows 7 operating system (OS), which is a sub-set of the normal retail version. The Microsoft License agreement limits the use of the system to what the machine is designed to do.

The Microsoft Update process is turned off by default to prevent interruptions during live streaming events. It is also not advised to use a Windows 7 installation CD to add features to the system or the appliance may fail.

You may load additional software on the appliance; however, ViewCast does not support this additional software. You also need to ensure the primary drive is not full or the appliance will fail. In the event of a problem, you may need to perform a Factory Restore, which returns the appliance to the original software load. You may save the current encoder profiles and reload them when the Factory Restore is complete.

You can perform a Factory Restore at any time. This process returns the appliance to the software load that came with the appliance. Perform a Factory Restore if the appliance becomes unstable due to installed applications, viruses, etc. Please refer to the user guide for instructions.

ViewCast Support can provide assistance should the appliance fail to start. In most cases, you can restore an appliance to operation without returning it to ViewCast. There is a fee in the event a user returns an appliance due to applications the user installed or if the appliance failed because the primary partition (drive C) is full.

Connecting to the Internet

The Internet is a dangerous place. Never connect a Niagara appliance directly to the Internet. Always use a router. A basic router is sufficient to protect the appliance and you can configure the router as needed to forward specific ports to the appliance. The router's bandwidth should match or exceed the speed of the appliance's network card.

The Shields Up test by Gibson Research (http://www.grc.com/intro.htm) is a good utility to verify you do not expose the Niagara appliance to the Internet. Select to test **All service ports**. The utility queries the appliance's outside IP address for all service ports less than 1056. All of these ports should report as **Stealth** and the analysis should show the tests have passed. Ports the router has forwarded show as open. This is OK and you should consider the test as passed.

Niagara 4100 front panel diagram

You should familiarize yourself with the front panel controls for the Niagara 4100 (Figure 2). Besides the basic buttons for power, start/stop, up/down and menu access, there are indicator lights that are hidden until illuminated.

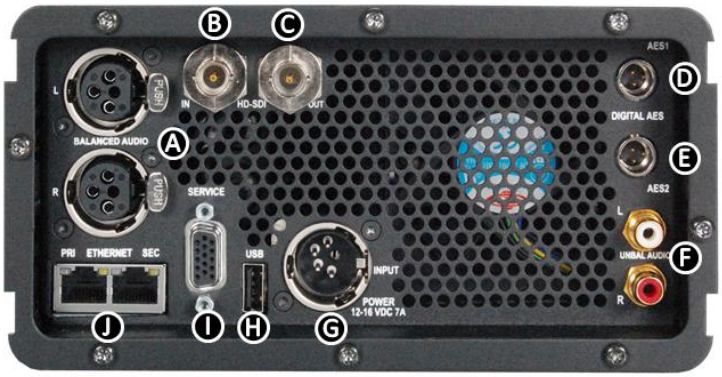
Figure 2. Niagara 4100 front panel

A	Press this button once to power up the appliance. When the appliance is powered up, press this button once will power it down.
B	Allows exporting files to USB devices and installing updates or firmware.
C	Indicates audio input presence.
D	Allows headphones to be connected to the appliance for audio monitoring.
E	Controls the audio level on the headphones.
F	Press this button to stop an encoder when it is highlighted on the LCD display.
G	Press this button to start the encoder highlighted on the LCD display.
H	These buttons are used for EASE menu navigation on the LCD display.
I	Press this button to enter or accept the menu choice highlighted on the LCD display. This button is used for EASE menu operations.
J	Press this button to activate the EASE menu on the LCD display.
K	When the Alarm Light indicator is lit, press this button to view a log of the most recent alarms recorded. Press **Enter** to clear these alarms from the log.
L	Displays menus and system messages.
M	This light indicates when the appliance detects that a video source is connected to one of its video inputs. *Note: This light only illuminates when you start an encoder.*
N	Indicates that another user is accessing the appliance across the network from a computer.
O	Indicates that an application alert has occurred.
P	When an encoder profile is assigned to one of these buttons, press the assigned button and then **Stream** to start the encoder. Press the assigned button and then **Stop** to stop the encoder.

Niagara 4100 back panel diagram

Refer to Figure 3 for all the connectors and other components of the Niagara 4100 back panel.

Figure 3. Niagara 4100 back panel



A	Left/right XLR connector for balanced audio sources. XLR connectors are used by professional audio engineers and are found on high-end audio and video playback equipment. *Note: A microphone preamplifier or mixer with XLR preamp functions is required to connect an XLR microphone to the balanced audio input.*
B	Receives high-definition SDI video to the unit. This SDI input allows professional-grade video connections.
C	Transmits high-definition SDI video from the unit.
D	Digital AES audio 1.
E	Digital AES audio 2.
F	Left/right RCA connectors for unbalanced audio sources.
G	Provides system power.
H	Connects USB control devices, such as a memory card (USB memory device, keyboard, and mouse).
I	Use this auxiliary VGA output port to connect an external VGA monitor so you can view the operating system interface.
J	Dual Ethernet ports provide redundant connections to your network to connect a video test signal, such as a color bar generator, to calibrate the video settings for video capture settings.

Connecting the Niagara 4100

Follow the steps in below to configure all Niagara 4100 connections. The example uses SDI video and audio. The following steps refer to a direct connection to the Niagara 4100 only.

To connect the Niagara 4100:

1. Connect to the SDI digital input for video and audio (item B on Figure 3). Ensure you have a tight connection.
2. Connect the power adaptor (item G on Figure 3).
3. Attach the Niagara 4100 to the network input (item J on Figure 3).
4. Press **Power** (item A on Figure 2).

Niagara 4100 EASE menu

The Niagara 4100 EASE menu (Figure 4) is located on the LCD panel on the front of the unit. The menu allows you to quickly and easily configure the Niagara 4100. You use the **Up** and **Down** arrow buttons to navigate through the different functions on the EASE menu.

Figure 4. EASE menu

Encode	• Start an encoding session. • Stop an encoding session. • View the status of an encoding session. • Shut down Niagara 4100.
Access Health	• Check the CPU status. • View available memory. • Check the temperature of the unit. • Check the versions.
Setup System	• Set the Preset A,B,C buttons. • View network settings. • Configure primary or secondary settings. • View link status. • Set the network MAC address. • Set time and date. • Set the video standard. • Perform a factory restore.
Export Files	• Export files to a USB memory device.
Shutdown System	• Restart system. • Power off system.

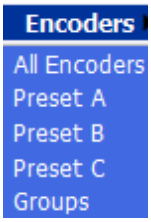
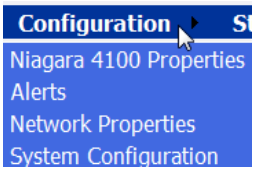
Niagara 4100 home page

The home page (Figure 5) is the first page that appears after you log into the Niagara SCX Remote Management Software. From this page, you can access the different windows for configuring, controlling, and monitoring the activities and alerts from the Niagara 4100.

Figure 5. Niagara 4100 home page

Menu bar commands

The home page menu bar allows you to use the menu bar commands.

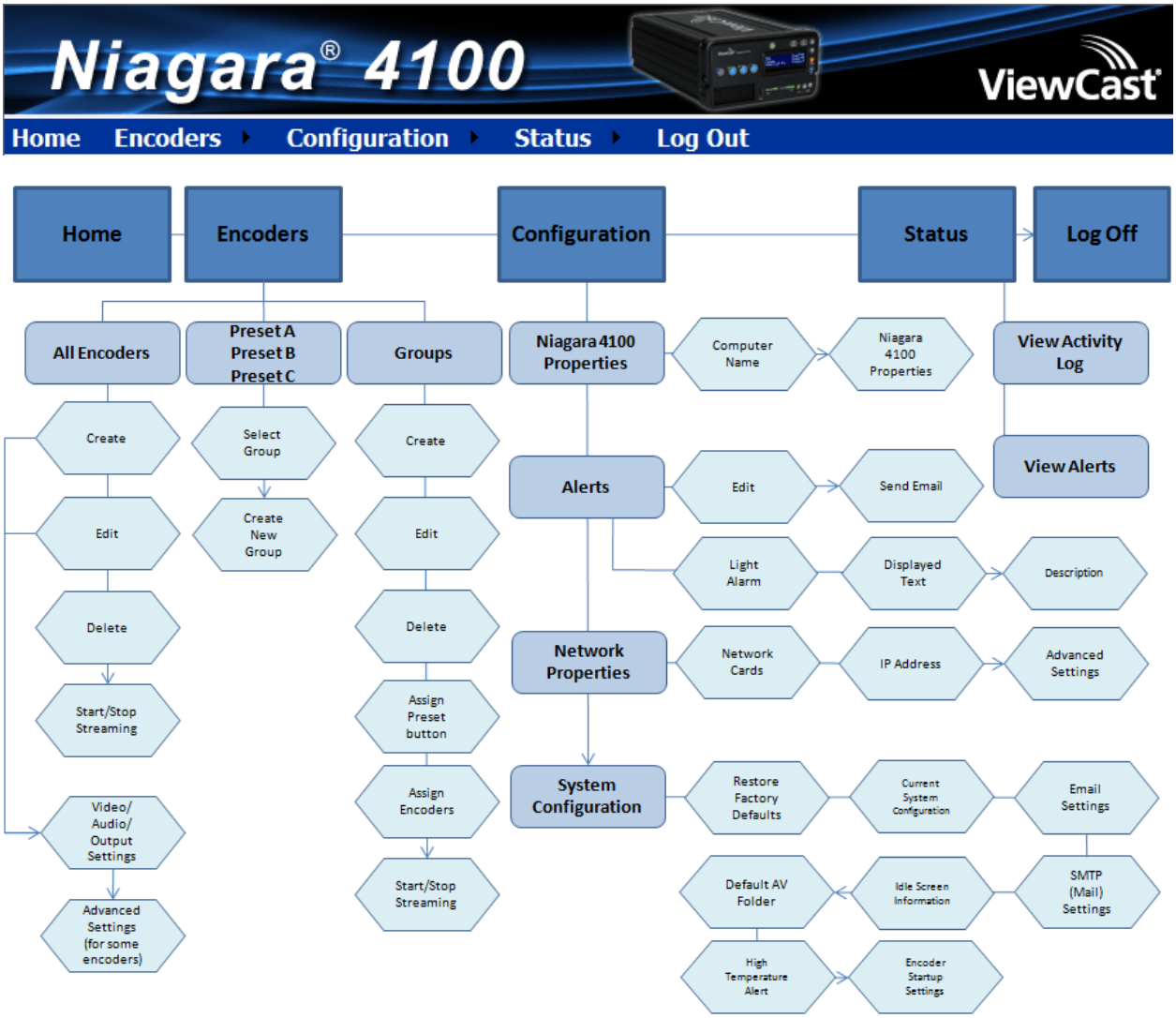
Home	• View general administrative information about the ViewCast Niagara 4100. • Use the menu bar commands.
	• **All Encoders** – View the encoder profiles available to start on the encoder box. • **Preset A** – Assign a loaded encoder profile to the A button on the front panel of the Niagara 4100. • **Preset B** – Assign a loaded encoder profile to the B button on the front panel of the Niagara 4100. • **Preset C** – Assign a loaded encoder profile to the C button on the front panel of the Niagara 4100. • **Groups** - Manage specific encoders assigned to groups.
	• **Niagara 4100 Properties** – View details on the **Machine Properties** of the Niagara 4100 including the **Network Name**, **Serial Number**, and all software versions installed. • **Alerts** – Modify the settings for each application alert Niagara 4100 can generate during normal operations. • **Network Properties** – View information on Niagara 4100 network properties and addresses for both NIC ports and

	modify these properties. • **System Configuration** – Modify the system configuration including setup for email alerts from Niagara 4100 whenever it encounters an operation error.
	• **View Activity Log** – View all Niagara 4100 activities including the time and date for each event. • **View Alerts** – View all alerts including the time and date for each alert.
Log Out	• Log out of the Niagara 4100 and return to the website login screen.

Niagara 4100 browser windows flow

Figure 6 shows the interrelationship and flow of the available windows you may use to configure the Niagara 4100.

Figure 6. Niagara 4100 browser window



Easy Setup

You use two interfaces to operate your Niagara 4100 streaming media appliance.

- Niagara 4100 front panel LCD display and buttons
- Web interface through Niagara SCX remote management software

Most of the basic operations can be performed from the front panel of the Niagara 4100 streaming media appliance.

You should perform most setup and operations by accessing the Niagara SCX web interface from a computer that resides on the same network as your Niagara 4100 appliance.

With the web interface, you can customize your encoding settings and assign specific encoding profiles to the Preset ABC buttons on the front panel. The web interface provides the ability to control your Niagara 4100 remotely from a computer that can be rooms or continents away from the system provided that both your Niagara 4100 and the computer have Internet access to communicate with each other.

The easy setup option explores the optimal configurations for the novice user to easily and quickly set up the Niagara 4100. Easy setup includes actions you can perform on your Niagara 4100 streaming media appliance using the web interface to include configuring the following:

- Encoder settings
- Groups
- Network properties
- Machine properties
- System configuration
- System alerts

Web interface

The web interface presents a logical flow of configuration information for the encoding appliance. Refer to Figure 6 for a diagram and menu bar commands which include:

- Home
- Encoders
  - *All Encoders including encoder properties*
  - *Presets A, B, and C*
  - *Groups*
- Configuration
  - *Niagara 4100 Properties*
  - *Alerts*
  - *Network Properties*
  - *System Configuration*
- Status
  - *Activity Log*
  - *Alerts*
- Log Out

Easy first time set up

You should read all instructions, notices, and warnings in the *About This Guide* section prior to getting started with your new Niagara 4100 hardware for the first time. Also, ensure you have all required parts and meet all system requirements before installing this product.

Do not continue with the installation if you find any components missing or damaged. Contact the ViewCast reseller where you purchased your Niagara 4100 system for assistance in obtaining any missing or replacement parts.

Connecting to an electrical power source

Niagara 4100 ships with one of the following power cables:

- North America power cable
- International power cable
- UK power cable

To connect the power source:

1. Attach the block end to the power input located on the Niagara 4100 AC/DC adapter.
2. Plug the other end of the cable into a wall outlet or surge protection enabled power strip connected to a wall outlet or other common power source.

WARNING! The plug-socket combination must remain accessible at all times as it serves as the main disconnecting device.

Do not work on the system or connect or disconnect cables during periods of lightning activity.

WARNING! When using 4-pin XLR to cigarette car plug cables, do not disconnect the car battery adaptor or turn off the car engine before you turn off the appliance. Doing so may damage the appliance.

Performing the initial start up

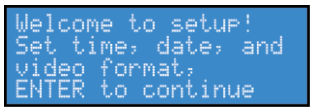
The first time you power up the Niagara 4100, a series of menus appear on the LCD display that will assist you in setting up the system clock, date, and video input format (NTSC (North America/Japan) or PAL).

The steps below refer to a *direct* connection to the Niagara 4100 only.

To perform the initial start up:

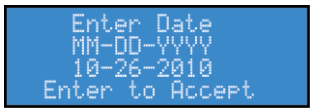
1. Ensure that you connect all devices (power cords, appliances, streaming devices, etc.) to the Niagara 4100.
2. Press **Power**  on the front panel to start the Niagara 4100. The LCD readout displays the welcome screen (Figure 7).

   Figure 7. Initializing messages

3. Press **Enter**  . The system prompts you to set the date (Figure 8).

   Figure 8. Date screen

4. Use the **Up** and **Down** arrow buttons  to change the numerical value of the month.
5. Press **Stop** to move to the field to the left. Press **Stream** to move to the field to the right.
6. Use the **Up** and **Down** arrow buttons to increment the numerical value of the day and year.

   *Note: If you want to change a previous setting, continue pressing **Stream** until the cursor cycles around to the desired field.*

7. Press **Enter** to accept the settings and move to the next screen to set the system clock (Figure 9). Niagara 4100 uses a 24-hour clock format for its system clock entries.

   Figure 9. Time screen

8. Use the **Up** and **Down** arrow buttons to change the numerical value of the hour.
9. Press **Stream** to enter the value and move to the Minute field.
10. Use the **Up** and **Down** arrow buttons to change the numerical value of the minute.

11. Press **Enter** to set the format. The screen appears (Figure 10) confirming you have successfully set up your Niagara 4100.

    Figure 10. Confirmation screen

12. Press **Enter** to exit the setup menu and reboot the appliance. The following screen appears:

    Figure 11. Booting screen

Connecting to an IP network

The Niagara 4100 network settings for its network interfaces default to dynamically obtain an IP address from a DHCP server on the network. If a DHCP server is not available or is not found on the network, then Niagara 4100 assigns its own IP address.

If you are not familiar with network protocols, contact your network administrator for assistance.

Changing the network settings

For most network environments, it will not be necessary to modify these default settings. However, if you wish to assign a static IP address or Gateway address to the appliance's Network Interface Cards (NICs), then you can change the network setting using the EASE menu.

To change the network settings:

1. Press **Menu**. The EASE menu appears.
2. Use the **Up** and **Down** arrow buttons to select the **Setup System** option.
3. Press **Enter**. The setup menu displays (Figure 12).

   Figure 12. Setup menu

4. Use the **Up** and **Down** arrow buttons to select **Network**.
5. Press **Enter**. The network interface screen appears (Figure 13).

   Figure 13. Interface screen

6. Use the **Up** and **Down** arrow buttons to select the network interface you wish to modify.

7. Press **Enter**. The settings screen appears (Figure 14).

Figure 14. Settings screen

8. Use the **Up** and **Down** arrow buttons to select **Change Settings**.
9. Press **Enter**. A screen appears that displays the various network settings.
10. Select the network setting you wish to change.

Note: Once you modify the setting, the system saves the changes until you modify the settings again or until you restore the system back to its original factory settings.

11. Press **Enter**. The network settings screen displays (Figure 15).

Figure 15. Network settings screen

12. Use the **Up** and **Down** arrow buttons to select **DHCP On/Off**.
13. Press **Enter**. The enable DHCP screen appears (Figure 16).

Figure 16. Enable DHCP screen

*Note: Press **Menu** to cancel this action and exit.*

14. Use the **Up** and **Down** arrow buttons to select **Yes**.
15. Press **Enter**. The screen with the network settings appears.
16. Repeat steps 12 through 15 to modify another network setting.
17. Use the **Up** and **Down** arrow buttons to enter a static address for the IP and/or Gateway address.
18. Press **Enter**. The IP address screen appears (Figure 17).

Figure 17. IP address screen

19. Use the **Up** and **Down** arrow buttons to change the numeric value incrementally and enter either the static IP or Gateway address.
20. Press **Stream** to move to the next field.
21. Press **Enter**. The subnet address screen appears (Figure 18).

Figure 18. Subnet address screen

22. Use the **Up** and **Down** arrow buttons to change the numeric value incrementally and enter the subnet address.
23. Press **Enter**.

Note: To remove a static IP and/or Gateway address, follow steps 12 through 15 to enable DHCP. The system removes any previously entered static address.

Basic Operations

You may customize your encoder settings and assign specific encoder profiles using the front panel.

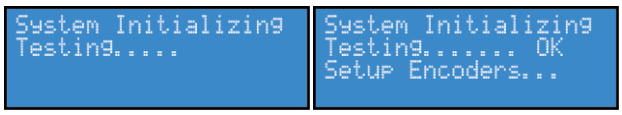
Starting up

If this is the first time you are using the Niagara 4100, refer to the *Performing the initial start up* section before continuing.

To start up:

1. Press **Power**  . The LCD readout displays the initializing messages (Figure 19).

   Figure 19. Initializing messages

   When the system is ready, the LCD display alternates between status readouts similar to the following:

2. Press **Menu**. The EASE menu appears.

Shutting down

Allow the Niagara 4100 to power down normally. If you force the system to shut down improperly, your data can be corrupted. If so, the next time you start the system it can take several minutes to complete startup.

To shut down:

1. Press **Menu**. Tab down to Shutdown System (Figure 20).

   Figure 20. EASE menu

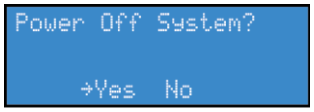
2. Press **Enter**. The shutdown screen appears (Figure 21).

   Figure 21. Shutdown screen

3. Tab to **Power Off System**. Press **Enter**. The Power Off System? screen appears.

   Figure 22. Power off screen

4. Tab to **Yes** and press **Enter**. The shutdown screens appear.

   Figure 23. Shutdown screens

   The system shuts down.

You can also shut down the system using the following steps:

1. Briefly press **Power**. The system stopping messages appear (Figure 24).

   Figure 24. System stopping messages

   After a few seconds, the system powers off.

Starting an encoder

Niagara 4100 is a single-channel encoder, which means you can only connect and stream one audio and video source at any given time. However, you can stream the same audio and video at multiple data rates and multiple formats to provide the best user experience for different viewing audiences.

For example, you can stream Windows Media at full resolution at 1500 kbps and at the same time stream Adobe Flash at CIF resolution at 500 kbps.

The Niagara 4100 LCD displays a list of available encoder profiles you can ue and the current status of each.

To start an encoder:

1. Press **Stream** on the front panel of your Niagara 4100. A list of available encoder profiles you can use and the current status of each appears (Figure 25).

   Figure 25. Encoder screen

   Note: The system abbreviates the name of each encoder profile to the first 10 characters. When creating names for custom profiles, be sure to create unique names that will be distinguishable by the first 10 characters.

2. Use the **Up** and **Down** arrow buttons to select the encoder profile you want Niagara 4100 to use for this encoding session.
3. Press **Stream** to start the encoder. The starting screen appears (Figure 26).

   Figure 26. Starting screen

   The encoder screen appears indicating that the encoder you selected has begun streaming (Figure 27).

   Figure 27. Encoder screen

   Note: If the encoder you started is assigned to one of the Preset ABC buttons, the corresponding button illuminates during and after the starting process.

4. Repeat this method to start streaming multiple encoders at the same time.

   WARNING! There is a limit to how many encoders the Niagara 4100 can stream at one time. If you exceed this limit, the streams will drop frames and the video will apppear to stutter resulting in a poor viewer experience. If you do not reduce the number of streams to lessen the CPU load, all encoders could self-terminate without warning. Refer to the Checking

CPU usage *section to understand the limitations.*

After the encoder session has successfully begun, the LCD display returns to the previous display of available encoders. The screen will indicate that the encoder profile you selected has begun encoding.

The video detection light illuminates if horizontal video sync is detected on either the S-Video or Composite video input of the Niagara 4100.

Checking CPU usage

When the Niagara 4100 is idle (no encoders are streaming), the CPU percentage is normally 4 % or less. If one or more encoders are streaming, the percentage is much higher and fluctuates in a range of +/- 10 %. If the system is using less than 70 %, you may start another encoder without adversely affecting system performance (depending on the complexity of the profile).

To check CPU usage:

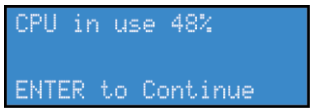
1. Press **Menu**. The EASE menu appears.
2. Use the **Up** and **Down** arrow buttons to select **Access Health**.
3. Press **Enter**. The access menu appears (Figure 28).

   Figure 28. Access menu

4. Use the **Up** and **Down** arrow buttons to select CPU.
5. Press **Enter**. A screen appears (Figure 29) with the amount of CPU cycles currently in use.

   Figure 29. CPU cycles screen

6. Press **Enter**.

Stopping an encoder

To stop an encoder:

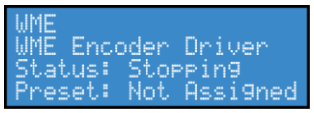
1. Press **Menu**. The EASE menu appears.
2. Press **Enter**. The encoder screen appears.
3. Use the **Up** and **Down** arrow buttons to highlight the encoder you wish to stop.
4. Press **Stop**. The encoder screen appears (Figure 30) showing the status of each encoder.

   Figure 30. Encoder screen

5. Use the **Up** and **Down** arrow buttons to select the encoder you want to terminate.
6. Press **Stop**. The stopping screen appears (Figure 31).

   Figure 31. Stopping screen

7. Press **Menu**. The EASE menu appears.

Connecting an external storage device

The Niagara 4100 has one USB port on the front panel and one on the back panel. You can connect almost any standard USB memory device to one or both of these ports. You can then export any audiovisual files you may have created on Niagara 4100's local storage drive. The local storage drive is drive D when you use the **Save to File setting** from the web interface.

When you insert a USB memory device in one of the USB ports on the Niagara 4100, the appliance automatically detects the removable storage device, and assigns a drive letter to the device. This device can capture files directly or you can use the Niagara 4100 **Export Files** function on the front panel menu.

Exporting captured video files

You can export your captured video files to an external USB drive. But first you must set a default location through the web interface. Refer to *Configuring default directory setting* before completing the steps below.

To export captured video files:

1. Insert a USB memory device into a USB port
2. Press **Menu**. The EASE menu appears.
3. Use the **Up** and **Down** arrow buttons and highlight the **Export Files** option (Figure 32).

   Figure 32. EASE menu

4. Press **Enter**. The USB device screen appears (Figure 33).

   Figure 33. USB Device screen

5. Press **Enter**. The drive destination screens appear (Figure 34).

   Figure 34. Drive Destination screens

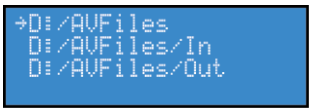
6. Use the **Up** and **Down** arrows to select the USB drive.

7. Press **Enter**. The select folder screen appears (Figure 35).

Figure 35. Select Folder screen

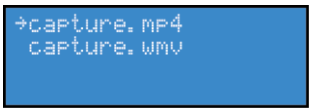
The select source screen appears (Figure 36).

Figure 36. Select source screen



8. Use the **Up** and **Down** arrows to select the desired directory.
9. Press **Enter**. The filename screen appears (Figure 37).

Figure 37. Filename screen



10. Use the **Up** and **Down** arrows to select the desired file to transfer.
11. Press **Enter**. While the Niagara 4100 exports the file, the exporting screens appear (Figure 38).

Figure 38. Exporting screens

Advanced Operations

The Niagara 4100 includes a web interface, which allows you to access the advanced system settings. The web interface also provides detailed settings and control over the encoder profiles installed on Niagara 4100.

Advanced operations include but are not limited to the following:

- Creating an encoder
- Viewing all encoders
- Starting/stopping an encoder
- Editing an encoder
- Creating a group
- Configuring the Preset ABC buttons
- Configuring machine properties
- Viewing alert status
- Configure network properties

The web interface does not require software and works with any computer that has a current web browser, including Windows®, Macintosh®, and Linux® machines. For the best user experience, ViewCast recommends Internet Explorer (you may need to use the compatibility mode). The Niagara 4100 must either reside on a shared IP network with the computer or can be directly connected to a Windows computer using an Ethernet cable (RJ45).

Logging in

To log in:

1. You can either locate the serial number:
   - On the underside of the appliance (in the format hsxxxxxx).

   Or
   - On the LCD display when the system is idle (Figure 39).

   Figure 39. System Ready screen

   Note: If the system ready screen does not immediately display, use the Up and Down arrow buttons to toggle through the system information until the system ready screen appears.
2. Open the web browser on your computer.
3. You can either:
   - Type the Niagara 4100 serial number in the Address bar (Figure 40).

Figure 40. Serial number

Or

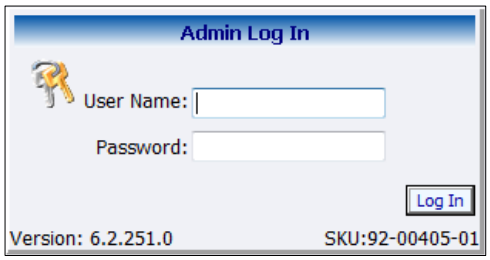
- Type the IP address in the Address bar (Figure 41).

Figure 41. IP address

Note: The IP address appears on the system ready screen when the system is idle.

The Admin Log In window appears (Figure 42).

Figure 42. Admin Log In window



4. Type the **User Name** and **Password**.

   IMPORTANT! The setting to log in for the first time, defaults to the user name admin and the password admin.

   Note: System administrators should previously configure all user names and passwords for those who they allow to log on to the system.

5. Press **Login**. The Niagara 4100 Welcome Window and menu bar appear (Figure 43).

Figure 43. Welcome window

Viewing all encoders

The Encoders window (Figure 44) provides a list of all of the encoder profiles loaded on the Niagara 4100. On the home page click **Encoders ➢ All Encoders.**

Figure 44. Encoders window

A	Displays the amount of CPU usage.
B	Click this link to create a new encoder.
C	Displays the total number of encoders.
D	Click this link to edit the encoder properties, streaming settings, and advanced streaming settings.
E	Click this link to delete an encoder from the list.
F	Displays the encoder type (for example Flash).
G	Displays the name of the encoder profile. This name appears on the LCD display on the front panel.
H	Displays the status of the last action.
I	Displays the message for the last action.
J	Displays as either **Started** (blue circle button) or **Stopped** (red circle button) as the options for streaming for this encoder. You can start or stop an encoder by clicking the icons.
K	Click this link to view encoder groups.
L	Click this link to stop all encoders.

You can also view encoders by clicking on the **View All Encoders** link at the bottom of the Preset A, B, or C window.

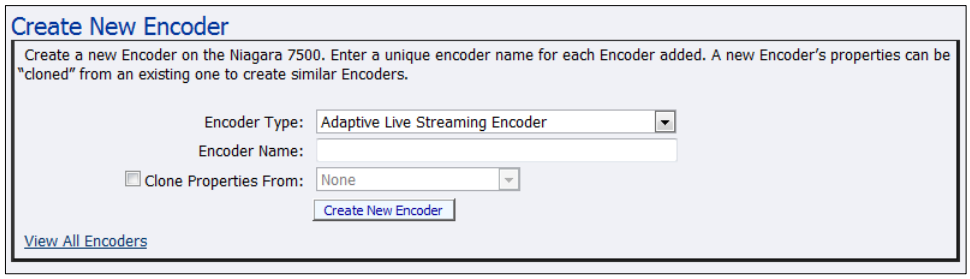
Creating an encoder

To create an encoder, on the home page click Encoders.

To create an encoder:

1. Click the **Create New Encoder** link. The Create New Encoder window displays (Figure 45).

   Figure 45. Create New Encoder window



2. Select the **Encoder Type** from the drop-down list.
3. Enter the name of the encoder.

   Note: Valid characters are alphanumeric, space, dash, and dot.
4. To use the same properties from another encoder, enable **Clone Properties From**.
5. Select the encoder from the drop-down list.
6. Click **Create New Encoder**.

Starting an encoder

To start an encoder, on the home page click **Encoders ➢ All Encoders.**

To start an encoder:

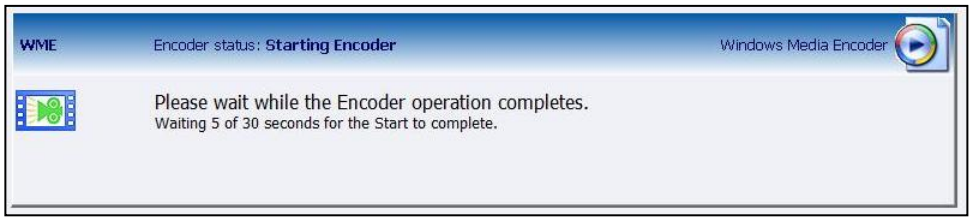
1. Click the red circle **Stopped** icon (Figure 46) in the **Streaming** column for the encoder you want to start streaming.

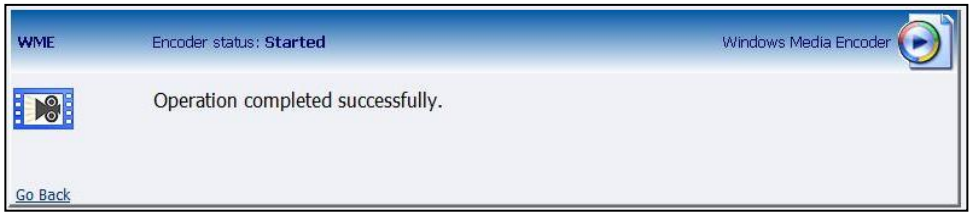
   Figure 46. Stopped icon

   Messages appear detailing the encoder start progress (Figure 47).

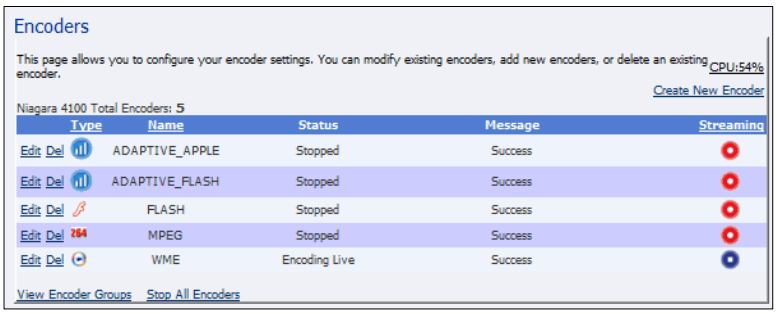
   Figure 47. Starting encoder

   The Encoders window appears with the encoder status updated and the streaming indicator changes to a blue circle Started icon (Figure 48).

   Figure 48. Encoders window

Stopping an encoder

To stop an encoder, on the home page click **Encoders ➢ All Encoders.**

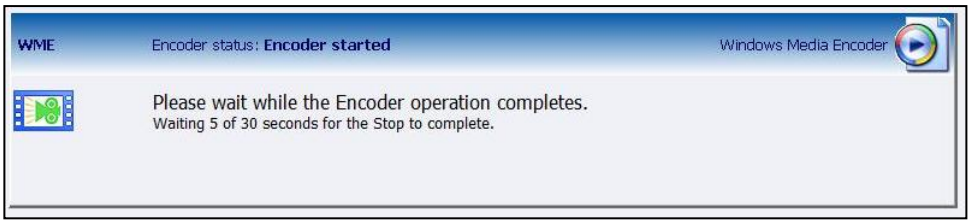
To stop an encoder:

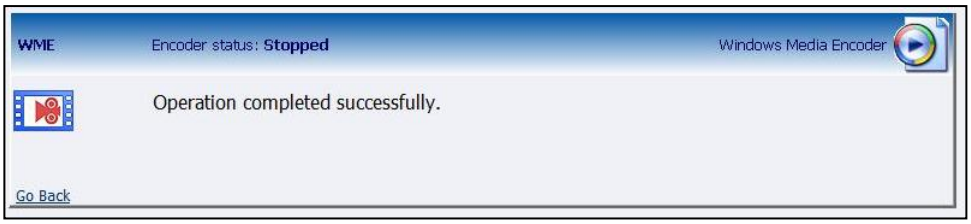
1. Click the blue **Started** icon of the encoder you wish to stop streaming (Figure 49).

Figure 49. Started icon

Messages appear detailing the encoder stop progress (Figure 50).

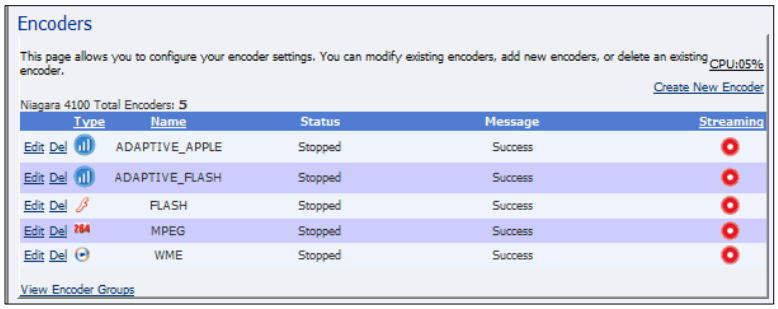
Figure 50. Encoder stopped





The Encoders window appears with the encoder status updated to reflect the Stopped mode (Figure 51).

Figure 51. Encoders window



Editing an Adaptive Apple HTTP encoder

When you create a new encoder, the Encoder Properties window appears. The Encoder Properties windows for editing a new encoder or an existing encoder are identical. You must configure the audio and video settings for each encoder type.

Use the Video, Audio, Output, and Security tabs to edit the settings. Begin with configuring the video and audio settings, then the streaming properties. The streaming properties and advanced streaming settings are different for each type of encoder.

You have two options for for a publisher on the adaptive encoder:

- Apple HTTP Live Streaming
- Adobe Flash Dynamic Streaming

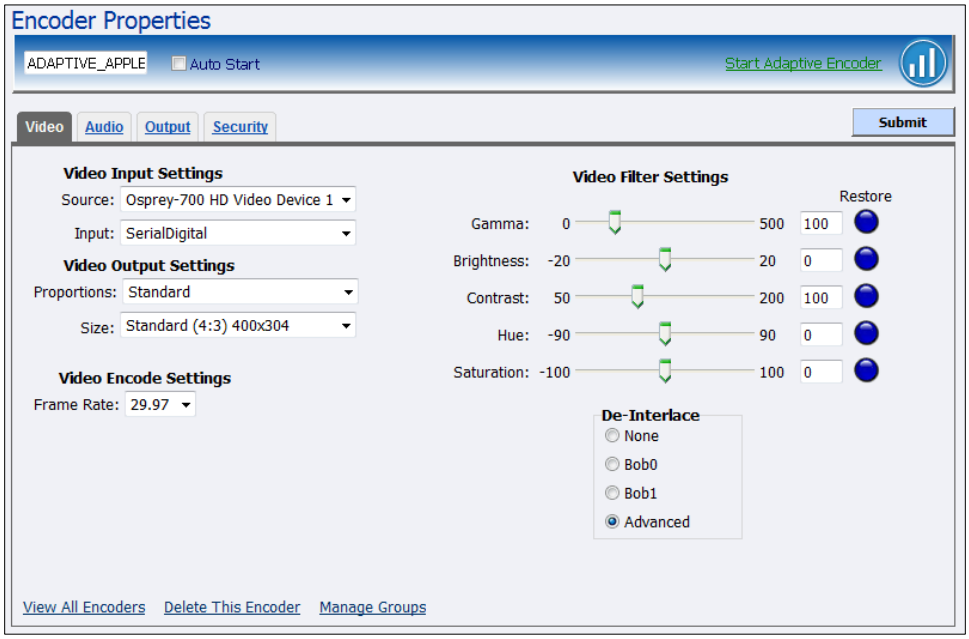
The fields on the Output tab and the Security tab are different depending on the type of publisher.

From the Adaptive Apple HTTP Encoder Properties window (Figure 52), you can set the encoder to start streaming automatically by clicking the **Auto Start** checkbox. You can also start the encoder from this window by clicking the **Start Adaptive Encoder** link in the top right corner of the window.

Click **Encoders** ➢ **All Encoders** from the home page. Then select the **Edit** link next to the adaptive encoder whose properties you wish to modify. The system displays the Encoder Properties window for the selected encoder.

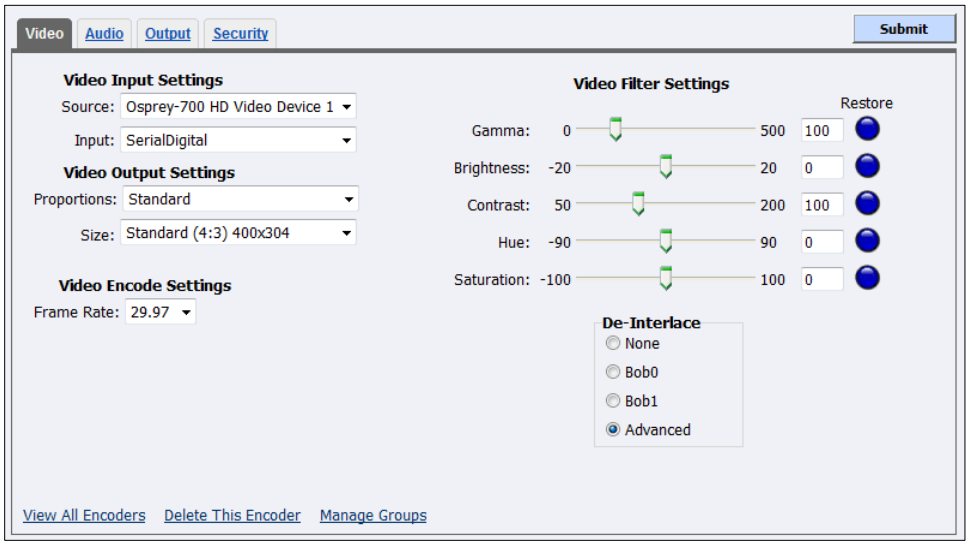
*IMPORTANT! If you make any changes to the Encoder Properties window, you must click **Submit**. Otherwise, all your changes will be lost.*

Figure 52. Adaptive Encoder Properties



Video tab

Figure 53. Video tab



To configure video settings:

1. In the **Source** field, the default is **Osprey-700 HD Video Device 1**.

   Note: Because the Niagara 4100 is a single-channel encoder, you can only connect and stream one audio and video source at any given time. However, you can encode the same audio and video at multiple data rates and multiple formats to provide the best user experience for different viewing audiences.

2. In the **Input** field, select the video input.

   IMPORTANT! The video input must match the connectors on the back of the Niagara 4100 and your video source.

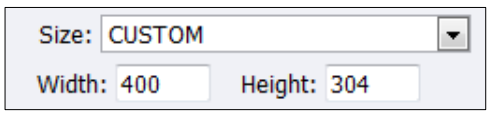
3. The **Proportions** field setting is **Standard** (square pixels for a VGA monitor).

4. In the **Size** field, select the pixel size of the encoded video. The standard sizes include:
   - Standard
   - Wide screen
   - Custom

   You can also specify a custom size for your video. This customization is useful when you are capturing video to be played on a mobile video-device that requires a non-standard size for compatibility.

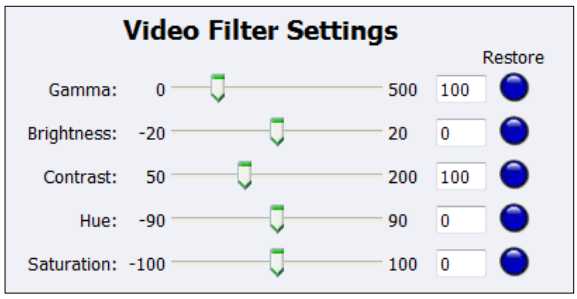
   When you click **Custom**, two additional fields appear so you can enter the exact size you want the resulting video to be (Figure 54).

   Figure 54. Custom fields



5. Select the **Frame Rate** from the drop-down list.
6. Drag the sliders to adjust the **Gamma**, **Brightness**, **Contrast**, **Hue**, and **Saturation** (Figure 55).

Figure 55. Video Filter Settings

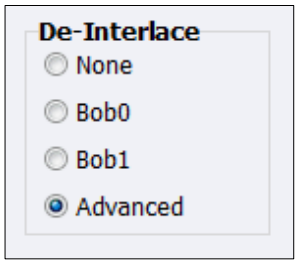


*Note: Click the **Restore** button to the right of the filter to reset the settings to the default.*

7. Click the **De-Interlace** setting you want to apply (Figure 56). Options include:

- **None**
  – Performs no de-interlacing of any kind.
- **Bob0**
  – Applies inverse telecine de-interlacing to all telecine video.
  – Applies motion adaptive de-interlacing to all video that is not telecine.
  – Switches dynamically between the two modes as the content changes.
  – Available for NTSC video only.
- **Bob1**
  – Drops the redundant fields and reassembles the video in a 24 fps progressive format.
  – Applies inverse telecine de-interlacing to all telecine video.
  – Performs no de-interlacing of video that is not telecine.
  –Available for NTSC video only.
- **Advanced**
  – Is an algorithm for de-interlacing pure video (non-telecine) content.
  – Applies motion adaptive interlacing to all video. It detects which portions of the image are still and which portions are in motion then applies different processing to each scenario.

Figure 56. De-Interlace settings

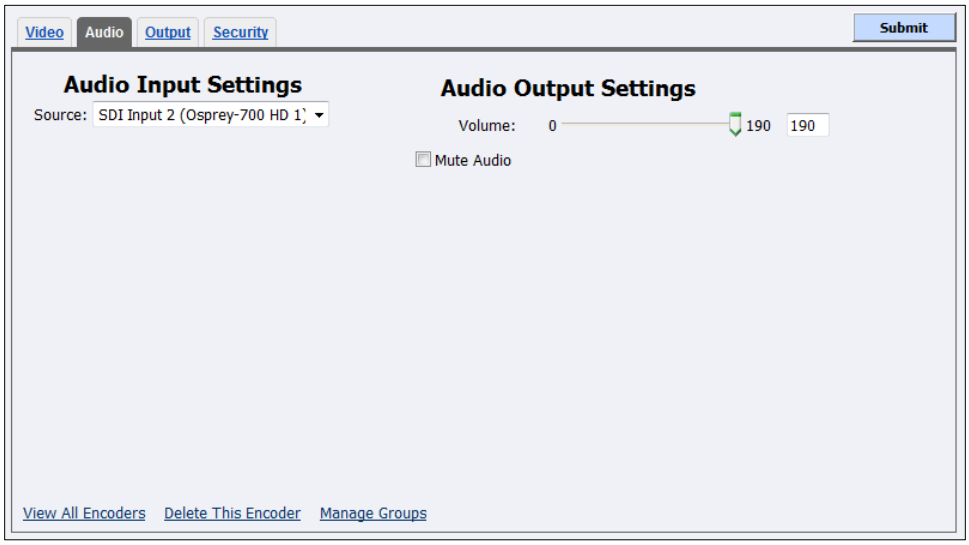


Note: Telecine and inverse telecine only apply to NTSC video. They are not used for PAL and SECAM video. The system disables Bob0 and Bob1 choices when you select either PAL or SECAM as the video standard.

8. Click **Submit**.

Audio tab

Figure 57. Audio tab



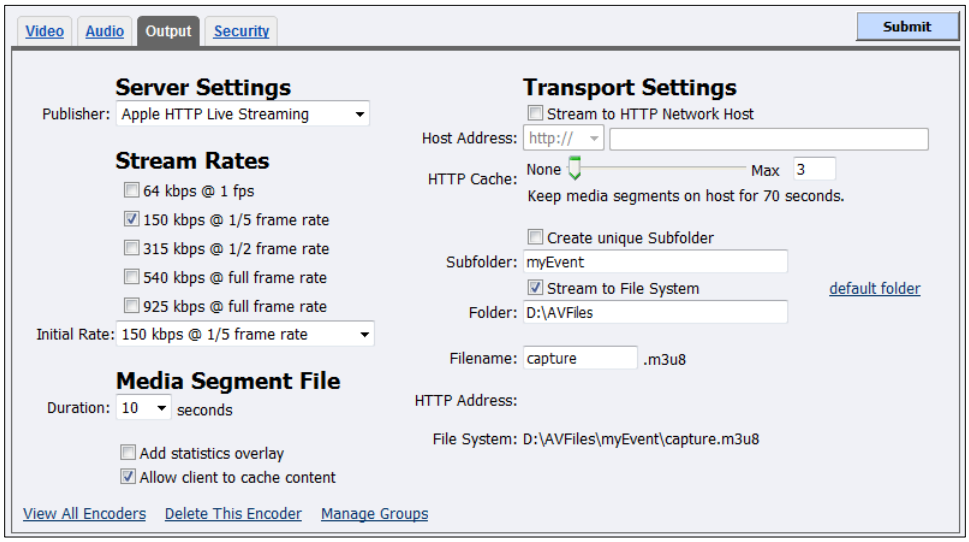
To configure audio settings:

1. In the **Source** field, click a device from the drop-down list.
   - AES Input 1 (Osprey-700 HD 1)
   - AES Input 2 (Osprey-700 HD 1)
   - Bal Input (Osprey-700 HD 1)
   - Digital Audio (S/PDIF) (High De
   - SDI Input 1 (Osprey-700 HD 1)
   - SDI Input 2 (Osprey-700 HD 1)
   - SDI Input 3 (Osprey-700 HD 1)
   - SDI Input 4 (Osprey-700 HD 1)
   - Unbal Input 1 (Osprey-700 HD 1)

   Note: Because the Niagara 4100 is a single-channel encoder, you can only connect and stream one audio and video source at any given time. However, you can encode the same audio and video at multiple data rates and multiple formats to provide the best user experience for different viewing audiences.
2. Drag the slider to adjust the **Volume**.
3. Click the checkbox to **Mute Audio**.
4. Click **Submit**.

Apple HTTP Live Streaming Output tab

Figure 58. Apple HTTP Live Streaming Output tab



To configure output settings:

1. In the **Publisher** field, click **Apple HTTP Live Streaming**.

   Note: Because the Niagara 4100 is a single-channel encoder, you can only connect and stream one audio and video source at any given time. However, you can encode the same audio and video at multiple data rates and multiple formats to provide the best user experience for different viewing audiences.

2. Enable each **Stream Rate** you want to be available. The bandwidth is cumulative so you must be careful not to exceed your network capability.
3. In the **Initial Rate** field, select a rate from the drop-down list.
4. In the **Media Segment File**, select the duration in seconds.
5. (Optional) Enable **Add statistics overlay**.
6. (Optional) Enable **Allow client to cache content**.
7. Enable **Stream to HTTP Network Host**.
8. Select the **Host Address**:
   - http://
   - ftp://

   Then enter the address in the next field.
9. Indicate the maximum **HTTP Cache** by dragging the slider for the number of files to maintain. A duration will be shown in seconds.
10. Enable **Create unique Subfolder** to create a file that the system does not overwrite.
11. Enter the name of the **Subfolder**.
12. Enable **Stream to File System**.
13. Accept the default location that displays in the **Folder** field. If the field is blank, click the **default folder** link to automatically populate the field.

Note: By default, the system sets this folder to D:\AVFiles. See Exporting captured video files *for instructions on saving video files to a USB device.*

WARNING! ViewCast strongly recommends you do not alter the default directory setting unless you fully understand the risk of saving your files to a directory not located on drive D. If you save your files to another drive on the Niagara 4100, the system could delete the files when you use the Restore to Niagara 4100 Factory Defaults feature.

Only drive D on the Niagara 4100 has available storage to save your files. Check drive properties for available free space to determine your storage capacity.

Use drives C, E, and F strictly for Niagara 4100 operational programs. Any modifications to these drives can permanently damage your system and void your warranty.

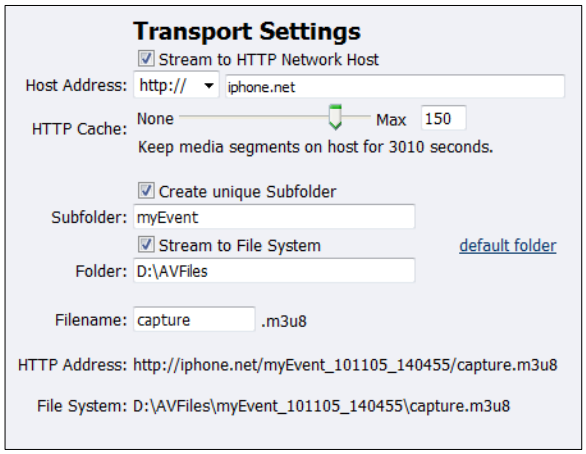
A better practice would be to use a Flash Media server to save a file or to save it to a remote drive. If you inadvertantly fill all available space, you risk losing your stream during a streaming event.

14. Enter the variant playlist file in the **Filename** field.

Note: The HTTP Address that displays at the bottom of the window is a combination of the Host Address, Subfolder, and Filename.

The File System that displays at the bottom of the window is a combination of the ***Folder****,* ***Subfolder,*** *and* ***HTTP Address****.*

Figure 59. Transport Settings



Apple HTTP Live Streaming Security tab via FTP

Figure 60. Apple HTTP Live Streaming Security tab via FTP

To configure security settings:

1. Select the **Authentication Type**.

   Note: If http: is selected as the Host Address on the Output tab, the option is Akamai Token Authentication.

2. Enter the **Query String**.

   Note: You can enter a minimum of 5 characters and a maximum of 12 characters.

3. Enter the password in the **Salt** field.

   Note: You can enter a maximum of 20 characters.

4. Enable **Encrypt Media Segment Files** to protect the content.

5. Select the **Key File**.

   Note: http:// is currently the only choice.

6. Enter the URL in the next field.

Editing an Adaptive Adobe Flash encoder

When you create a new encoder, the Encoder Properties window appears. The Encoder Properties windows for editing a new encoder or an existing encoder are identical. You must configure the audio and video settings for each encoder type.

Use the Video, Audio, Output, and Security tabs to edit the settings. Begin with configuring the video and audio settings, then the streaming properties. The streaming properties and advanced streaming settings are different for each type of encoder.

You have two options for for a publisher on the adaptive encoder:

- Apple HTTP Live Streaming
- Adobe Flash Dynamic Streaming

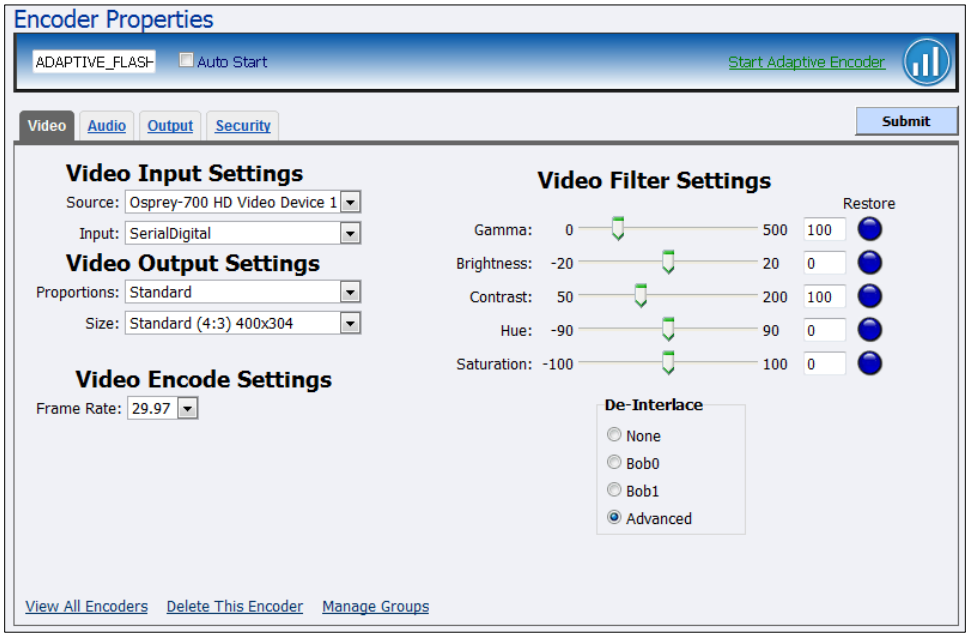
The fields on the Output tab and the Security tab are different depending on the type of publisher.

From the Adaptive Adobe Flash Encoder Properties window (Figure 61), you can set the encoder to start streaming automatically by clicking the **Auto Start** checkbox. You can also start the encoder from this window by clicking the **Start Flash Encoder** link in the top right corner of the window.

Click **Encoders** ➢ **All Encoders** from the home page. Then select the **Edit** link next to the Adaptive Adobe Flash encoder whose properties you wish to modify. The system displays the Encoder Properties window for the selected encoder.

*IMPORTANT! If you make any changes to the Encoder Properties window, you must click **Submit**. Otherwise, all your changes will be lost.*

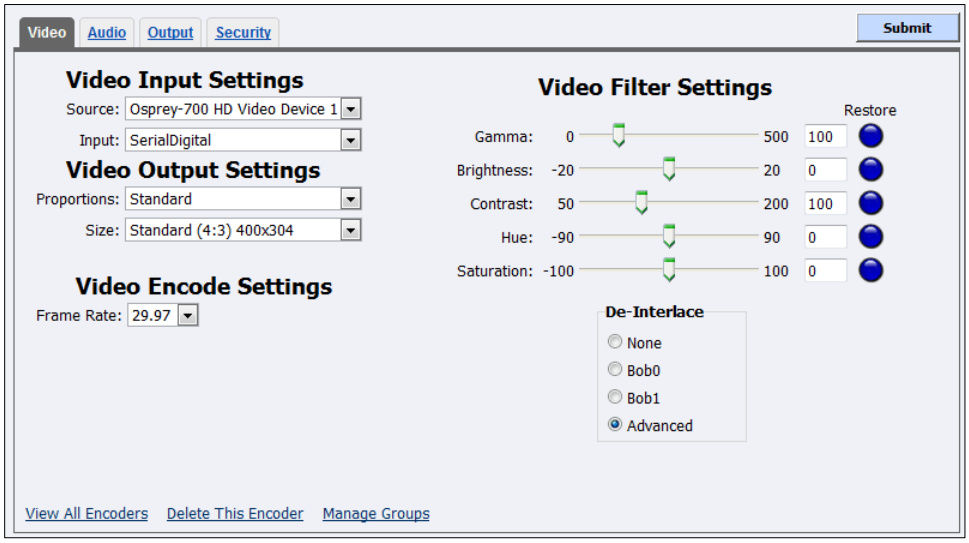
Figure 61. Adaptive Adobe Flash Encoder Properties



Video tab

Flash adds some additional frame and bit rate controls. The frame rate changes the frames per second that the video will be encoded. You can use the audio format setting to modify the audio frequency and change stereo to mono. The bit rate settings pertain to the amount of data per second the audio and video are captured. Decreasing the bit rate for both or either decreases the playback viewing quality.

Figure 62. Video tab



To configure video settings:

1. In the **Source** field, the default is Osprey-700 HD Video Device 1.

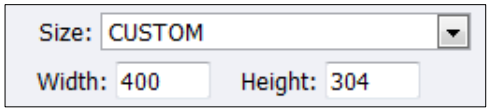
   Note: Because the Niagara 4100 is a single-channel encoder, you can only connect and stream one audio and video source at any given time. However, you can encode the same audio and video at multiple data rates and multiple formats to provide the best user experience for different viewing audiences.

2. In the **Input** field, the video input is **SerialDigital**.
3. The **Proportions** field setting is **Standard** (square pixels for a VGA monitor).
4. In the **Size** field, select the pixel size of the encoded video. The standard sizes include:
   - Standard
   - Widescreen
   - Custom

   You can also specify a custom size for your video. This customization is useful when you are capturing video to be played on a mobile video-device that requires a non-standard size for compatibility.

   When you click **Custom**, two additional fields appear so you can enter the exact size you want the resulting video to be (Figure 63).

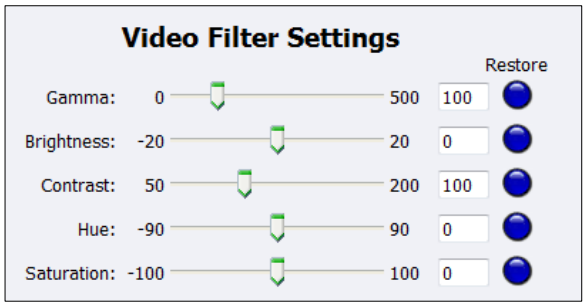
Figure 63. Custom fields



Note: Choosing a size larger than 1280 x 420 is not recommended due to the high data rates CPU usage required.

5. Select the **Frame Rate** from the dro-down list.
6. Drag the sliders to adjust the **Gamma**, **Brightness**, **Contrast**, **Hue**, and **Saturation** (Figure 64).

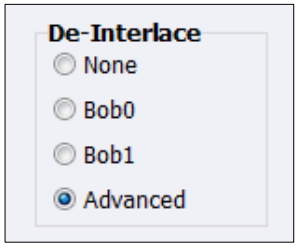
Figure 64. Video Filter Settings



*Note: Click the **Restore** button to the right of the filter to reset the settings to the default.*

7. Click the **De-Interlace** setting you want to apply (Figure 65). Options include:
   - **None**
     – Performs no de-interlacing of any kind.
   - **Bob0**
     – Applies inverse telecine de-interlacing to all telecine video.
     – Applies motion adaptive de-interlacing to all video that is not telecine.
     – Switches dynamically between the two modes as the content changes.
     – Available for NTSC video only.
   - **Bob1**
     – Drops the redundant fields and reassembles the video in a 24 fps progressive format.
     – Applies inverse telecine de-interlacing to all telecine video.
     – Performs no de-interlacing of video that is not telecine.
     –Available for NTSC video only.
   - **Advanced**
     – Is an algorithm for de-interlacing pure video (non-telecine) content.
     – Applies motion adaptive interlacing to all video. It detects which portions of the image are still and which portions are in motion then applies different processing to each scenario.

Figure 65. De-Interlace settings

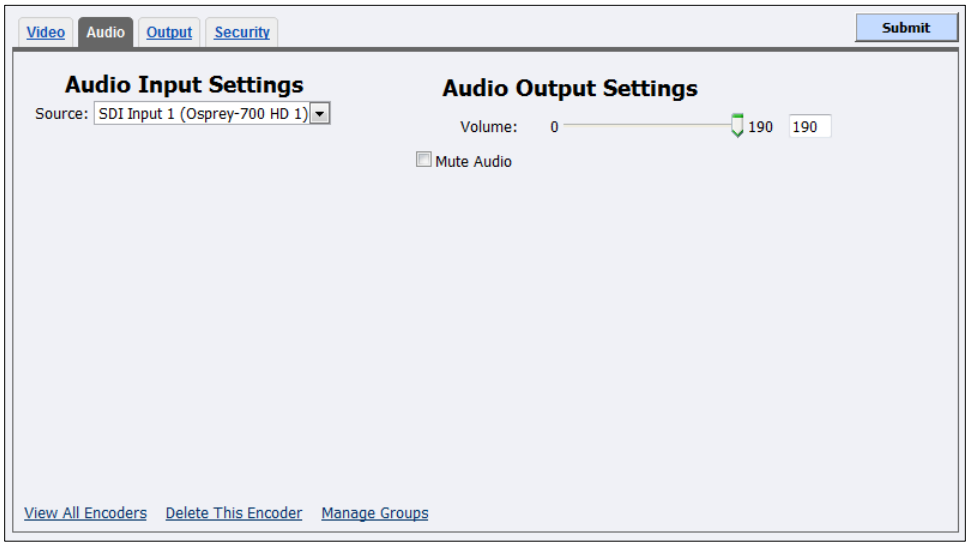


Note: Telecine and inverse telecine only apply to NTSC video. They are not used for PAL and SECAM video. The system disables Auto and Inverse Telecine choices when you select either PAL or SECAM as the video standard.

8. Click **Submit**.

Audio tab

Figure 66. Audio tab



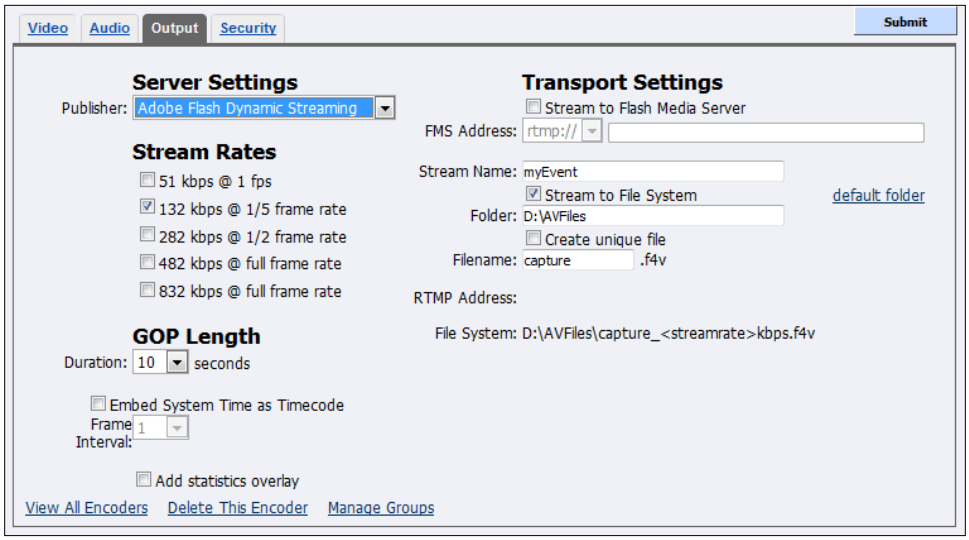
To configure audio settings:

1. In the **Source** field, select an audio source from the drop-down list:
   - AES Input 1 (Osprey-700 HD 1)
   - AES Input 2 (Osprey-700 HD 1)
   - AES Input 3 (Osprey-700 HD 1)
   - AES Input 4 (Osprey-700 HD 1)
   - Digital Audio (S/PDIF (High De
   - SDI Input 1 (Osprey-700 HD 1)
   - SDI Input 2 (Osprey-700 HD 1)
   - SDI Input 3 (Osprey-700 HD 1)
   - SDI Input 4 (Osprey-700 HD 1)

   IMPORTANT! The audio input must match the connectors on the back of the Niagara 4100 and your audio source.
2. Drag the slider to adjust the **Volume**.
3. (Optional) Click to **Mute Audio**.
4. Click **Submit**.

Adobe Flash Dynamic Streaming Output tab

Figure 67. Adobe Flash Dynamic Streaming Output tab



To configure output settings:

1. In the **Publisher** field, select **Adobe Flash Dynamic Streaming**.

   Note: Because the Niagara 4100 is a single-channel encoder, you can only connect and stream one audio and video source at any given time. However, you can encode the same audio and video at multiple data rates and multiple formats to provide the best user experience for different viewing audiences.

2. Enable each **Stream Rate** that you want to be available. The bandwidth is cumulative so you must be careful not to exceed your network capability.
3. Select the **Duration** of the GOP in seconds.
4. Enable the **Embed System Time as Timecode**.
5. Enter the **Frame Interval**.
6. (Optional) Enable the **Add statistics overlay**.
7. Enable the **Stream to Flash Media Server**.
8. Enter the **FMS Address**.
9. Enter the **Stream Name**.
10. Enable **Stream to File System**.
11. Accept the default location that displays in the **Folder** field. If this field is blank, click the **default folder** link to automatically populate the field.

    Note: By default, the system sets this folder to D:\AVFiles. See Exporting captured video files for instructions on saving video files to a USB device.

    WARNING! ViewCast strongly recommends you do not alter the default directory setting unless you fully understand the risk of saving your files to a directory not located on drive D. If you save your files to another drive on the Niagara 4100, the system could delete the files when you use the Restore to Niagara 4100 Factory Defaults feature.

Only drive D on the Niagara 4100 has available storage to save your files. Check drive properties for available free space to determine your storage capacity.

Use drives C, E, and F strictly for Niagara 4100 operational programs. Any modifications to these drives can permanently damage your system and void your warranty.

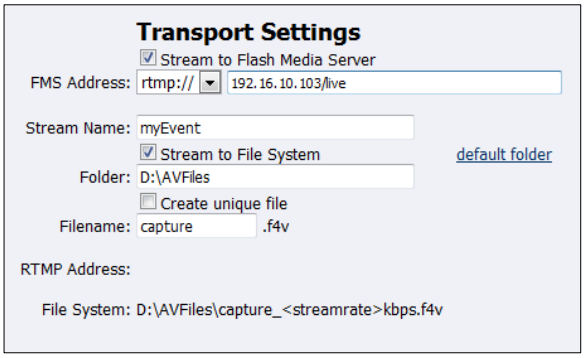
A better practice would be to use a Flash Media server to save a file or to save it to a remote drive. If you inadvertantly fill all available space, you risk losing your stream during a streaming event.

12. Enter the **Filename**.

*Note: The **RTMP Address** that displays at the bottom of the window is the **Host Address**, **FMS Address**.*

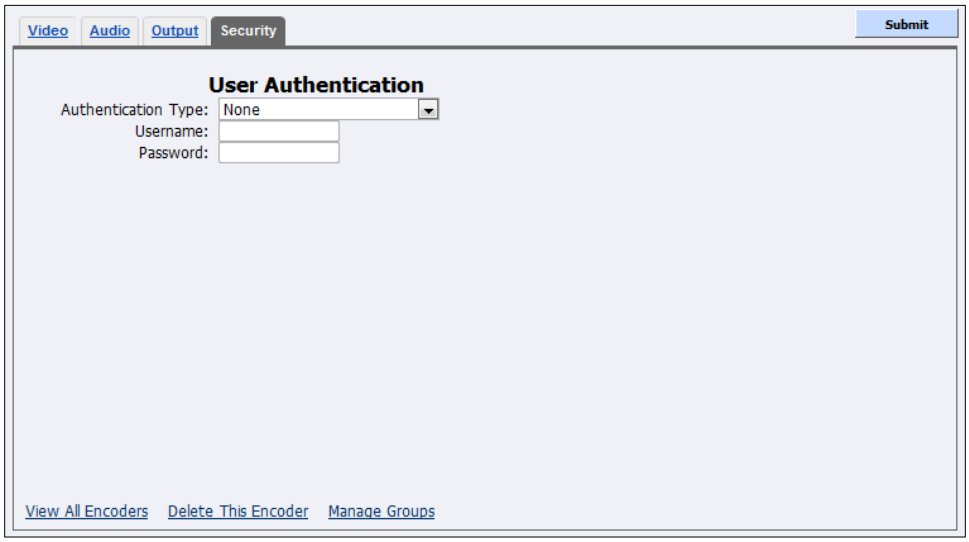
*The **File System** that displays at the bottom of the window is a combination of the **Folder** and **Filename**.*

Figure 68. Transport Settings



Adobe Flash Dynamic Streaming Security tab

Figure 69. Adobe Flash Dynamic Streaming Security tab



To configure security settings:

1. Select the **Authentication Type** for transport type:
   - Akamai Entry Point
   - LimeLight Server
2. Enter the **Username**.

   Note: You can enter a maximum of 80 characters.
3. Enter the **Password**.

   Note: You can enter a maximum of 20 characters.

Editing an Adobe Flash H.264 encoder

When you create a new encoder, the Encoder Properties window appears. The Encoder Properties windows for editing a new encoder or an existing encoder are identical. You must configure the audio and video settings for each encoder type.

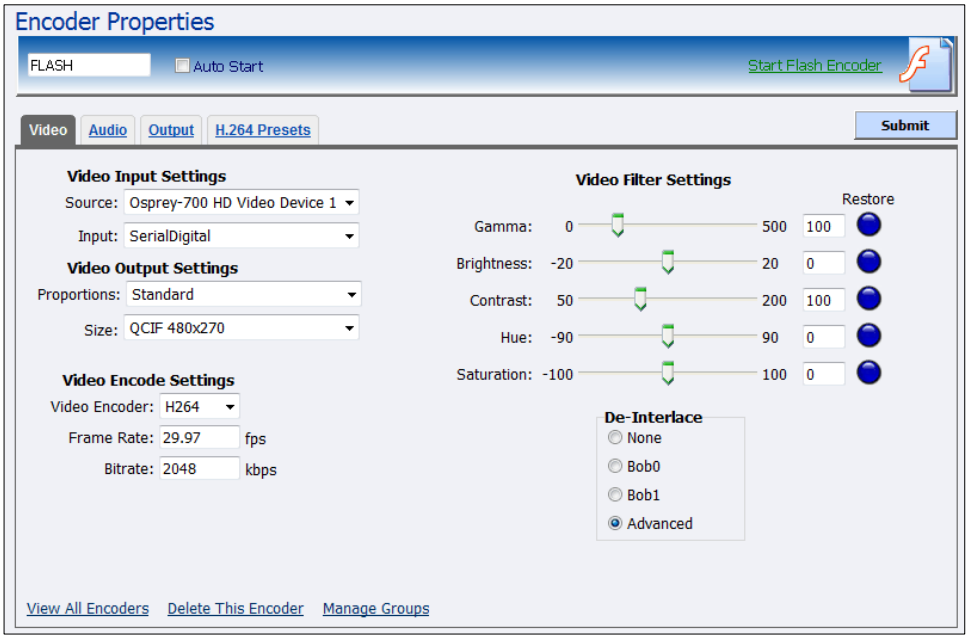
Use the Video, Audio, Output, and H.264 Presets tabs to edit the settings. Configure the video and audio settings, then the streaming properties. The streaming properties and advanced streaming settings are different for each type of encoder.

From the Flash Encoder Properties window (Figure 70), you can set the encoder to start streaming automatically by clicking the **Auto Start** checkbox. You can also start the encoder from this window by clicking the **Start Flash Encoder** link in the top right corner of the window.

Click **Encoders ➢ All Encoders** from the home page. Then select the **Edit** link next to the encoder whose properties you wish to modify. The system displays the Encoder Properties window for the selected encoder.

*IMPORTANT! If you make any changes to the Encoder Properties window, you must click **Submit**. Otherwise, all your changes will be lost.*

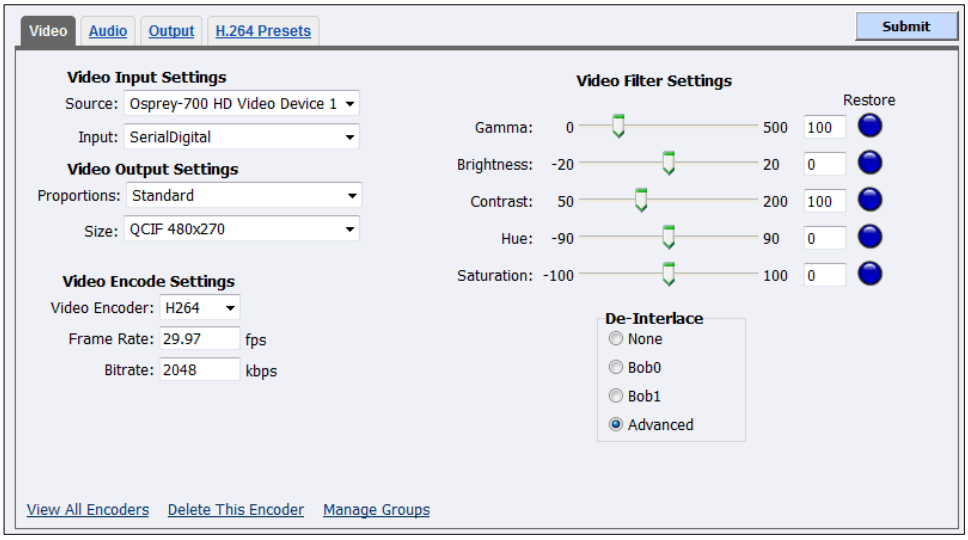
Figure 70. Flash Encoder Properties



Video tab

Flash adds some additional frame and bit rate controls. The frame rate changes the frames per second that the video will be encoded. The bit rate settings pertain to the amount of data per second the audio and video are captured.

Figure 71. Video tab



To configure video input settings:

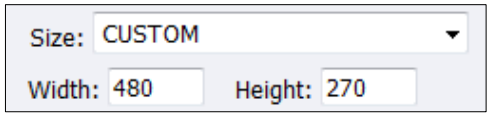
1. In the **Source** field, click a device from the drop-down list.
   - Osprey-700 HD Video Device 1
   - Disabled

   Note: Because the Niagara 4100 is a single-channel encoder, you can only connect and stream one audio and video source at any given time. However, you can encode the same audio and video at multiple data rates and multiple formats to provide the best user experience for different viewing audiences.
2. In the **Input** field, the video input is **SerialDigital**.
3. The **Proportions** field setting is **Standard** (square pixels for VGA monitor).
4. In the **Size** field, click the pixel size of the encoded video from the drop-down list.
   - HD 1280x720
   - CIF for video scaled from full-size to ¼ size
   - QCIF for video scaled from full-size to ¼ size
   - Custom

   You can also specify a custom size for your video. This customization is useful when you are capturing video to be played on a mobile video-device that requires a non-standard size for compatibility.

   When you click **Custom**, two additional fields appear so you can enter the exact size you want the resulting video to be (Figure 72).

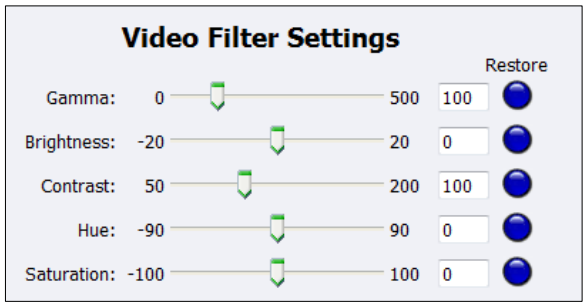
Figure 72. Custom fields



Note: Choosing a size larger than 1280 x 720 is not recommended due to the high data rate and CPU usage required.

5. Enter the frames per second in the **Frame Rate** field.
6. Enter the **Bitrate**.
7. Drag the sliders to adjust the **Gamma**, **Brightness**, **Contrast**, **Hue**, and **Saturation** (Figure 64).

Figure 73. Video Filter Settings

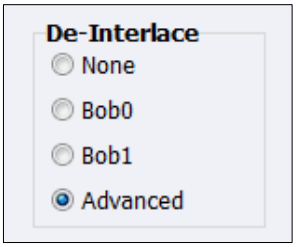


*Note: Click **Restore** to the right of the filter to reset the settings to the default.*

8. Click the **De-Interlace** setting you want to apply (Figure 74). Options include:

- **None**
  – Performs no de-interlacing of any kind.
- **Bob0**
  – Applies inverse telecine de-interlacing to all telecine video.
  – Applies motion adaptive de-interlacing to all video that is not telecine.
  – Switches dynamically between the two modes as the content changes.
  – Available for NTSC video only.
- **Bob1**
  – Drops the redundant fields and reassembles the video in a 24 fps progressive format.
  – Applies inverse telecine de-interlacing to all telecine video.
  – Performs no de-interlacing of video that is not telecine.
  –Available for NTSC video only.
- **Advanced**
  – Is an algorithm for de-interlacing pure video (non-telecine) content.
  – Applies motion adaptive interlacing to all video. It detects which portions of the image are still and which portions are in motion then applies different processing to each scenario.

Figure 74. De-Interlace Settings

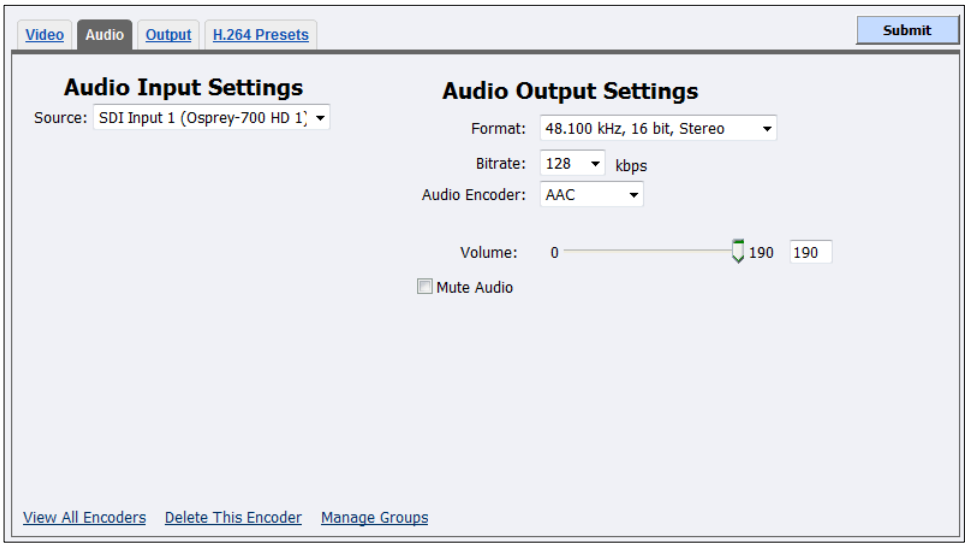


*Note: Telecine and inverse telecine only apply to NTSC video. They are not used for PAL and SECAM video. The system disables **Bob0** and **Bob1** choices when you select either **PAL** or **SECAM** as the video standard.*

9. Click **Submit**.

Audio tab

Figure 75. Audio tab



To configure audio settings:

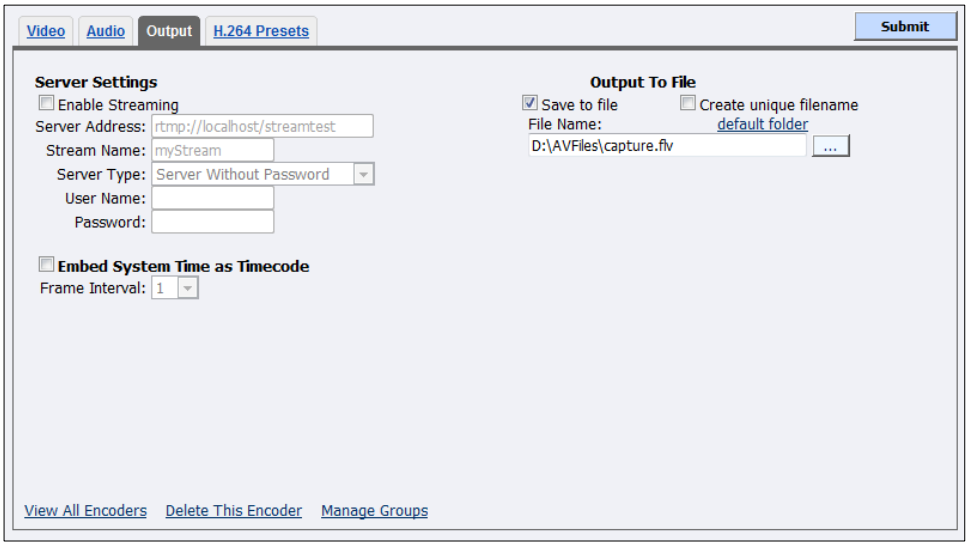
1. In the **Source** field, select an audio source from the drop-down list.
   - Disabled
   - AES Input 1 (Osprey-700 HD 1)
   - AES Input 2 (Osprey-700 HD 1)
   - Bal Input 1 (Osprey-700 HD 1)
   - SDI Input 1 (Osprey-700 HD 1)
   - SDI Input 2 (Osprey-700 HD 1)
   - SDI Input 3 (Osprey-700 HD 1)
   - SDI Input 4 (Osprey-700 HD 1)
   - Unbal Input 1 (Osprey-700 HD-1)

   IMPORTANT! The audio input must match the source connected on the back of the Niagara 4100 and your audio source.
3. Click the **Format** from the drop-down list.
4. Click the **Bitrate** from the drop-down list.
5. Click the **Audio Encoder** from the drop-down list.
6. Touch and drag the slider to adjust the **Volume**.
7. (Optional) Click the **Mute Audio** checkbox to disable audio.
8. Click **Submit**.

Output tab

You need Adobe Flash Media Server 3.5 or greater to stream Flash H.264.

Figure 76. Output tab



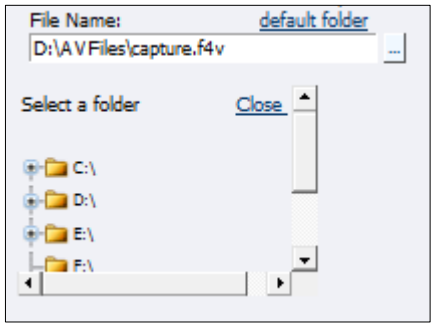
To configure output settings:

1. Click the **Enable Streaming** checkbox to enable live Flash streaming.
2. Enter the proper IP address in the **Server Address** field.
3. Enter the **Stream Name**.
4. Click the **Server Type** from the drop-down list. Options are available for streaming directly to Akamai and Limelight CDNs.
5. Enter the **User Name** and **Password**.
6. (Optional) Enable **Embed System Time as Timecode**.
7. (Optional) Click the **Frame Interval** from the drop-down list.
8. Enable **Save to File** to save the encoded content to a file. Each time you start this encoder, the system overwrites the previous file.

   *Note: You must enable either **Enable Streaming** or **Save to File**. If both **Enable Streaming** and **Save to File** are disabled, the encoder will not start and an error is generated.*
9. Enable **Create unique file** to create a file that the system does not overwrite.
10. Accept the default location that displays in the **File Name** field or choose your own location for the file. To choose your own personal location select the link (horizontal ellipses or …) to the right of the File Name field and display the options (Figure 77).

    Note: By default, the system sets this folder to D:\AVFiles\ with a default filename of capture.xxx.

Figure 77. Save to File Location



WARNING! ViewCast strongly recommends you do not alter the default directory setting unless you fully understand the risk of saving your files to a directory not located on drive D. If you save your files to another drive on the Niagara 4100, the system could delete the files when you use the Restore to Niagara 4100 Factory Defaults feature.

Only drive D on the Niagara 4100 has available storage to save your files. Check drive properties for available free space to determine your storage capacity.

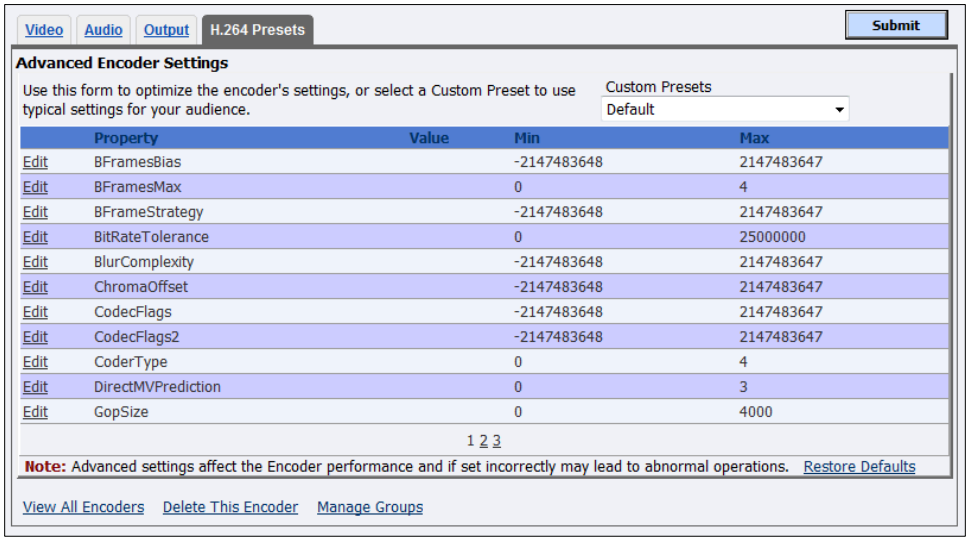
Use drives C, E, and F strictly for Niagara 4100 operational programs. Any modifications to these drives can permanently damage your system and void your warranty.

A better practice would be to use the Flash Media server to save a file or to save it to a remote drive. If you inadvertantly fill all available space, you risk losing your stream during a streaming event.

H.264 Presets tab

You can edit specific H.264 encoder settings or you can select a custom preset to use typical settings for your profile. These advanced settings affect the way the Encoder performs and if set incorrectly may lead to abnormal encoder operations (Figure 76). Refer to *Appendix B* for suggested values for the type of video you are streaming and a complete list of typical settings.

Figure 78. H.264 Presets tab



To configure H.264 settings:

1. Click **Edit** next to the setting you want to modify.

   IMPORTANT! These advanced settings affect the way the Encoder performs and if set incorrectly may lead to abnormal encoder operations. Refer to Appendix B: H.264 Advanced Settings *for suggested values for the type of video you are streaming.*

2. Change the value.

3. Click **Update**.

4. Click the **Restore Defaults** link at the bottom of the window to return the settings to the defaults.

   *Note: The database has seven profiles. Clicking **Restore Defaults** for one profile will change all profiles back to the default settings.*

Editing an MPEG-4 encoder

When you create a new encoder, the Encoder Properties window appears. The Encoder Properties windows for editing a new encoder or an existing encoder are identical. You must configure the audio and video settings for each encoder type.

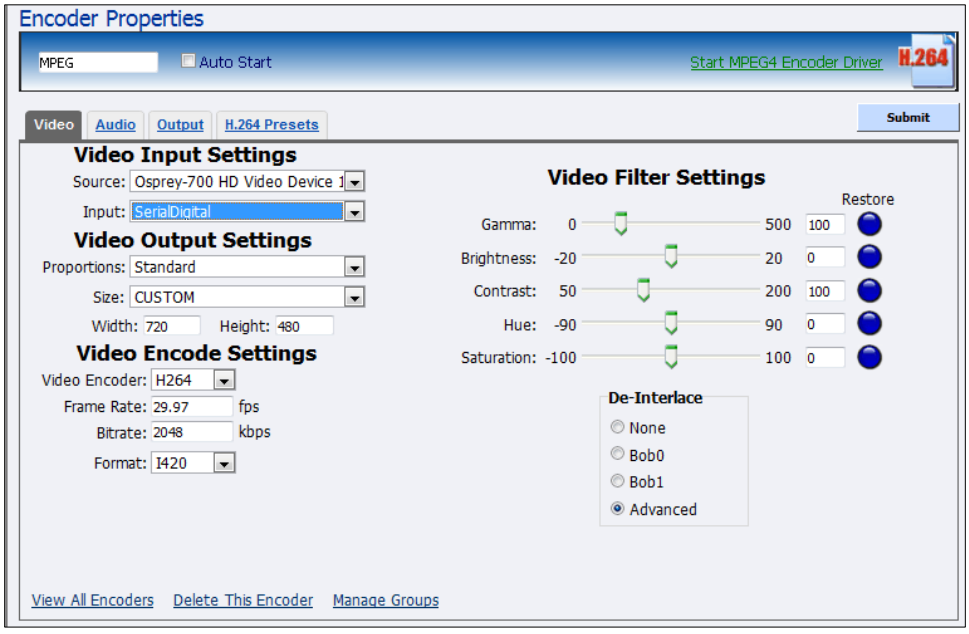
Use the Video, Audio, Output, and H.264 Presets tabs to edit the settings. Begin with configuring the video and audio settings, then the streaming properties. The streaming properties and advanced streaming settings are different for each type of encoder.

From the MPEG Encoder Properties window (Figure 79), you can set the encoder to start streaming automatically by clicking the **Auto Start** checkbox. You can also start the encoder from this window by clicking the **Start MPEG4 Encoder Driver** link in the top right corner of the window.

Click **Encoders ➢ All Encoders** from the home page. Then select the **Edit** link next to the MPEG encoder whose properties you wish to modify. The system displays the Encoder Properties window for the selected encoder.

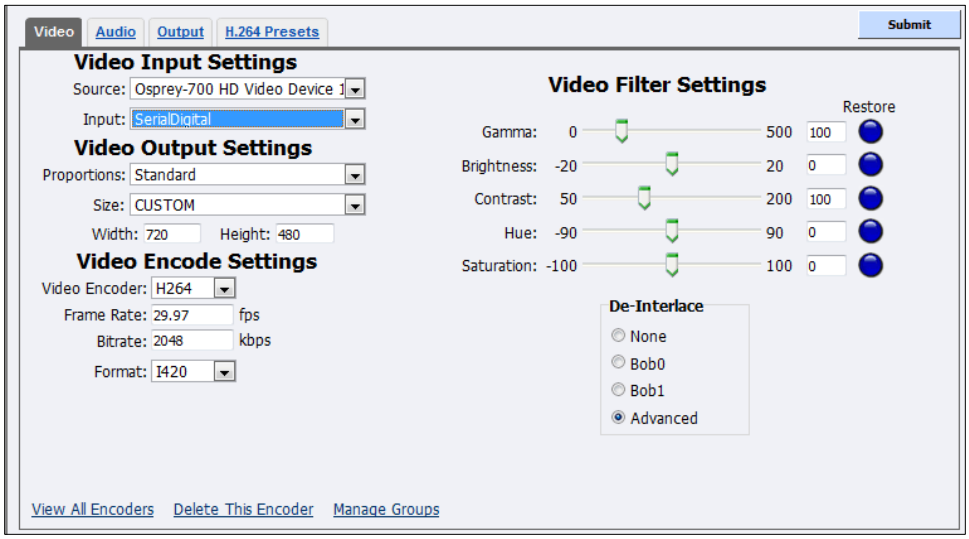
*IMPORTANT! If you make any changes to the Encoder Properties window, you must click **Submit**. Otherwise, all your changes will be lost.*

Figure 79. MPEG4 Encoder Properties



Video tab

Figure 80. Video tab



To configure video settings:

1. In the **Source** field, click a device from the drop-down list:
   - Osprey-700 HD Video Device 1
   - Disabled

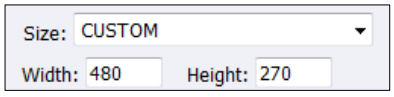
   Note: Because the Niagara 4100 is a single-channel encoder, you can only connect and stream one audio and video source at any given time. However, you can stream the same audio and video at multiple data rates and multiple formats to provide the best user experience for different viewing audiences.

2. In the **Size** field, select the pixel size of the encoded video. The standard sizes include:
   - HD 1280 x 720
   - Full-size for full screen video
   - CIF for video scaled from full-size to ½ size
   - QCIF for video scaled from full-size to ¼ size
   - Custom

   You can also specify a custom size for your video. This customization is useful when you are capturing video to be played on a mobile video-device that requires a non-standard size for compatibility.

   When you click **Custom**, two additional fields appear so you can enter the exact size you want the resulting video to be (Figure 81).

   Figure 81. Custom fields

   Note: CIF and QCIF are proportional to the HD video resolution input.

3. Click the type of **Video Encoder** for Internet video, mobile phones set top boxes, and create

media files for other MPEG-4 compatible devices such as iPods according to the following Motion Picture Expert Group (MPEG) types (refer to Table 1 and Table 2).

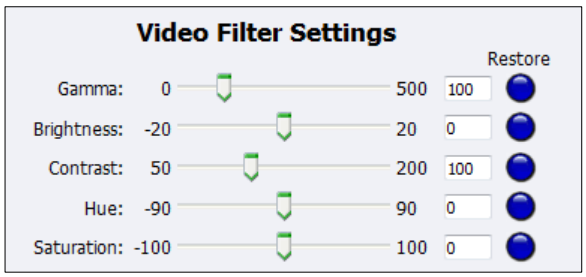
IMPORTANT! Choose the container type (MP4, 3G2, and 3GP) on the Output tab.

4. Enter the frames per second in the **Frame Rate** field.
5. Enter the kilobits per second in the **Bitrate** field.
6. In the **Format** field, indicate the color space format.

   *IMPORTANT! If you specify a video size incompatible with the color space of your source video, the system will automatically correct the size to the closes compatible setting when you click **Submit**.*

7. Drag the sliders to adjust the **Gamma**, **Brightness**, **Contrast**, **Hue**, and **Saturation** (Figure 82).

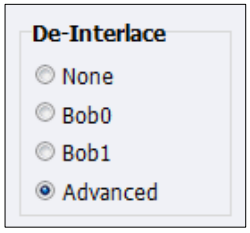
   Figure 82. Video Filter Settings



   *Note: Click **Restore** to the right of the filter to reset the settings to the default.*

8. Click the **De-Interlace** setting you want to apply (Figure 83). Options include:
   - **None**
     – Performs no de-interlacing of any kind.
   - **Bob0**
     – Applies inverse telecine de-interlacing to all telecine video.
     – Applies motion adaptive de-interlacing to all video that is not telecine.
     – Switches dynamically between the two modes as the content changes.
     – Available for NTSC video only.
   - **Bob1**
     – Drops the redundant fields and reassembles the video in a 24 fps progressive format.
     – Applies inverse telecine de-interlacing to all telecine video.
     – Performs no de-interlacing of video that is not telecine.
     –Available for NTSC video only.
   - **Advanced**
     – Is an algorithm for de-interlacing pure video (non-telecine) content.
     – Applies motion adaptive interlacing to all video. It detects which portions of the image are still and which portions are in motion then applies different processing to each scenario.

Figure 83. De-Interlace settings



Note: Telecine and inverse telecine only apply to NTSC video. They are not used for PAL and SECAM video. The system disables Bob0 and Bob1 choices when you select either PAL or SECAM as the video standard.

9. Click **Submit**.

Table 1. MPEG encoder and container descriptions

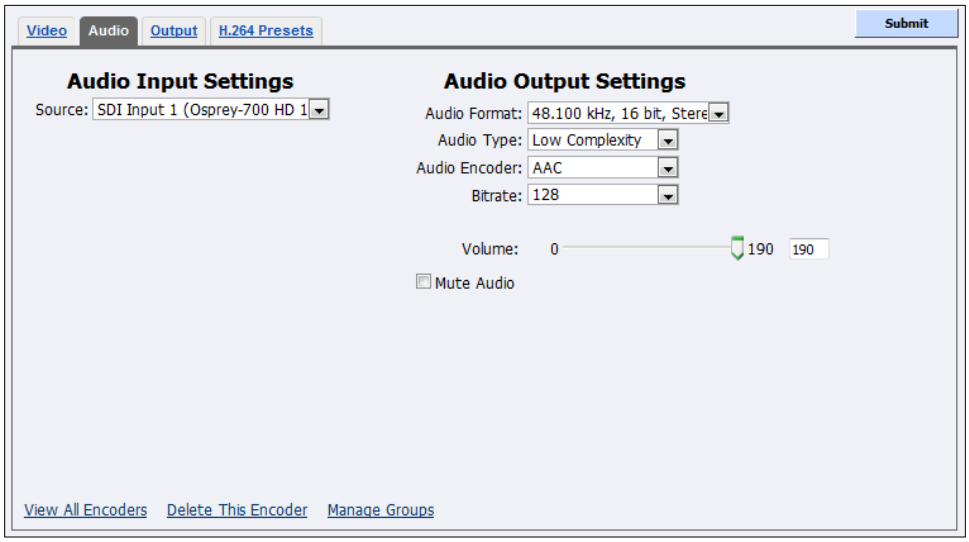
MPEG4 – MP4	MPEG-4 Part 2 is for situations where low bit rate and low resolution are mandated by other conditions of the applications, such as network bandwidth or device size. Examples of video applications for MPEG-4 are cell phones, some low-end video conferencing systems, and surveillance systems. MPEG-4 is important for legacy handheld devices that do not support H.264.
H264 – MP4	H.264, MPEG-4 Part 10, or AVC (Advanced Video Coding) was designed for high data compression while maintaining better quality than its predecessor, H.263. It also addresses a broad range of applications from low bit rate to high bit rate and from low resolution such as cell phones to high resolution such as broadcast. Niagara SCX's H.264 is Baseline Profile.
The Third Generation Partnership Project (3GPP) defined 3GP as a multimedia container format for use on 3G mobile phones. It stores video streams such as MPEG-4 or H.264 and audio streams such as AAC. This format has two defined standards: ● 3GPP for GSM-based mobile phones ● 3GPP2 for CDMA-based mobile phones This setting creates an H.263 stream stored in a 3GPP container.	
H264 – 3GP	This setting creates an H.264 stream stored in a 3GP container.
H264 – 3G2	This setting creates an H.264 stream stored in a 3G2 container.
MPEG4 – 3GP	This setting creates an MPEG-4 stream stored in a 3GP container.
MPEG4 – 3G2	This setting creates an MPEG-4 stream stored in a 3G2 container.
H263 – 3GP	This setting creates an H.263 stream stored in a 3GP container.
H263 – 3G2	This setting creates an H.263 stream stored in a 3G2 container.

Table 2. Valid output container selections for video encoder types

Container	H.263 Video	MPEG-4 Video	H.264 Video
MP4	N/A	✓	✓
3GP	✓	✓	✓
3G2	✓	✓	✓

Audio tab

Figure 84. Audio tab



To configure audio settings:

1. In the **Source** field, select an audio source from the drop-down list.
   The audio source is multiple inputs denoted by the following incrementing decimal values:
   - Disabled
   - AES Input 1 (Osprey-700 HD 1)
   - AES Input 2 (Osprey-700 HD 1)
   - Bal Input 1 (Osprey-700 HD 1)
   - Digital Audio (S/PDIF (High Def
   - SDI Input 1 (Osprey-700 HD 1)
   - SDI Input 2 (Osprey-700 HD 1)
   - SDI Input 3 (Osprey-700 HD 1)
   - SDI Input 4 (Osprey-700 HD 1)
   - Unbal Input 1 (Osprey-700 HD 1)

   IMPORTANT! The audio input must match the connectors on the back of the Niagara 4100 and your audio source.
2. Click the **Audio Format** from the drop-down list.
3. Click the **Audio Type** from the drop-down list:
   - **Main** – The same as Low Complexity, but adds backward prediction.
   - **Low Complexity** – The simplest and most widely used AAC audio format type.

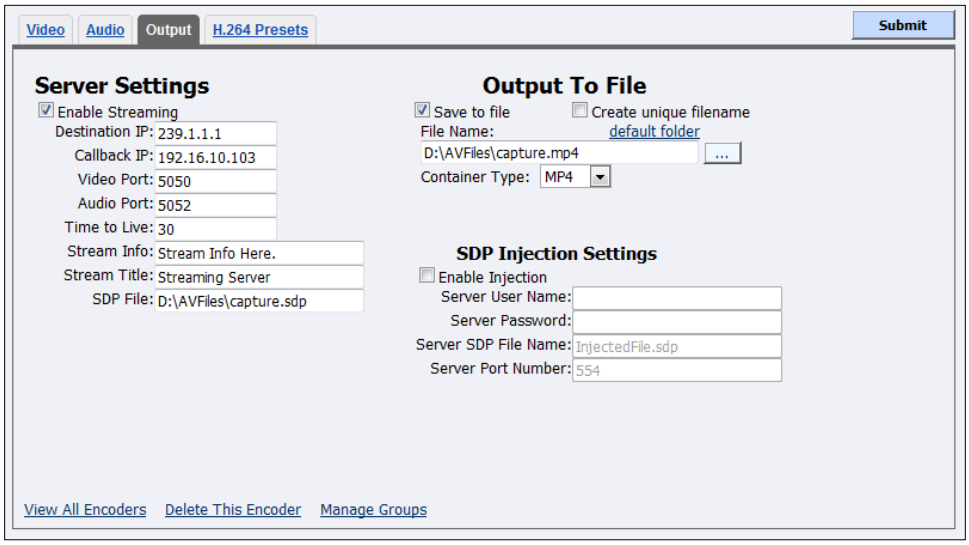
   Note: Depending on the player on which the resulting stream will be rendered, either choice will use a specific set of tools to encode the audio stream. Make your choice based on the requirement of the playback software or device. The most widely supported format is the Low Complexity profile.
4. The default **Audio Encoder** is AAC (Advanced Audio Coding) a standardized, lossy

compression and encoding scheme for digital audio. AAC achieves better audio quality than MP3. AAC and MP3 are MPEG standards.

5. Click the **Bitrate** from the drop-down menu.
6. Drag the slider to adjust the **Volume**.
7. (Optional) Click the **Mute Audio** checkbox to disable audio.
8. Click **Submit**.

Output tab

Figure 85. Output tab



To configure output settings:

1. Click the **Enable Streaming** checkbox to stream your audiovisual content via RTSP.
2. Set the appropriate streaming properties.

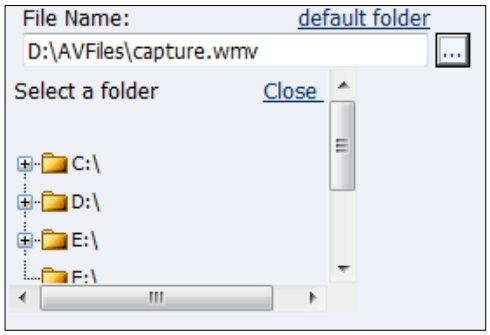
   Note: The default settings will enable multicast streaming. If you do not want this, change the IP address for Group to the IP address of the server to which you want to stream from the encoder.
3. In the **SDP File** field, enter a name and a destination path for the resulting SDP file created when you start the stream. If you are streaming to Helix, a QuickTime, or a Darwin server, refer to its respective documentation or online message boards for setup details specific for the individual streaming server.

   Note: You can stream point-to-point by selecting a share destination directory for the saved SDP file. Remember to disable multicasting by entering in the IP address of the PC to which you want to stream.

   For example, if you want another PC to view the stream, save the SDP file to a share folder on the local drive. The other PC can open the SDP file and the stream can be played in a QuickTime or other MPEG-4 compatible streaming player. Since MPEG-4 encoding can be CPU intensive, it is not recommended that you view the stream on the Niagara encoder. Doing so may overtax the host CPU, which will cause video quality degradation and encode session failure.
4. Enable **Save to File** to save the encoded content to a file. Each time you start this encoder, the system overwrites the previous file.
5. Enable **Create unique file** to create a file that the system does not overwrite.
6. Accept the default location that displays in the **File Name** field or choose your own location for the file. To choose your own personal location select the link (horizontal ellipses or …) to the right of the **File Name** field and display the options (Figure 86).

Note: By default, the system sets this folder to D:\AVFiles\ with a default file name of capture.xxx. See Exporting captured video files *for instructions on saving video files to a USB device.*

Figure 86. Select a folder



WARNING! ViewCast strongly recommends you do not alter the default directory setting unless you fully understand the risk of saving your files to a directory not located on drive D. If you save your files to another drive on the Niagara 4100, the system could delete the files when you use the Restore to Niagara 4100 Factory Defaults feature.

Only drive D on the Niagara 4100 has available storage to save your files. Check drive properties for available free space to determine your storage capacity.

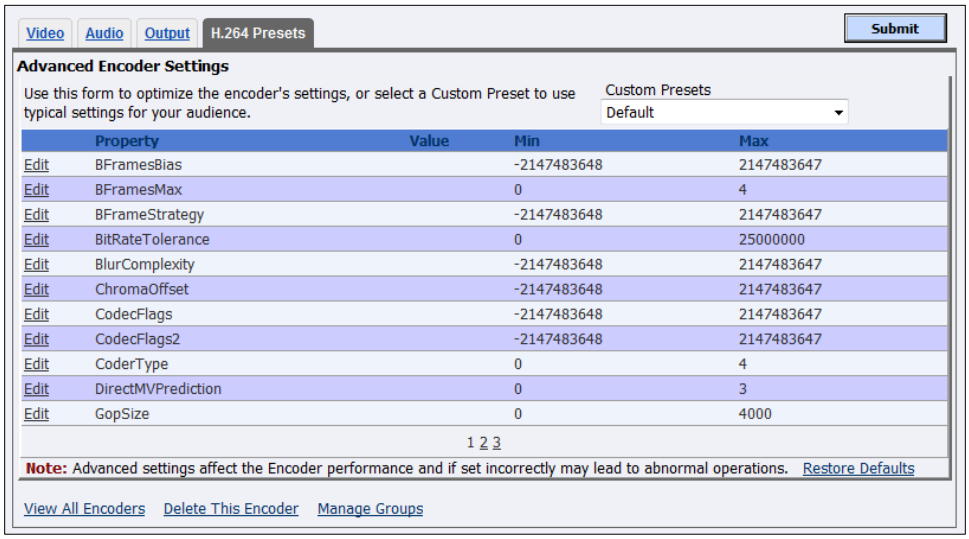
Use drives C, E, and F strictly for Niagara 4100 operational programs. Any modifications to these drives can permanently damage your system and void your warranty.

A better practice would be to use a streaming server to save a file or to save it to a remote drive. If you inadvertantly fill all available space, you risk losing your stream during a streaming event.

7. Select the **Container Type**.
8. Click the **Enable Injection** checkbox to inject an SDP file onto your server.
9. Set the appropriate setting for the server.
10. Enter the username and password.
11. Enter the **Server SDP File Name**.
12. Enter the **Server Port Number**.
13. Click **Submit**.

H.264 Presets tab

Figure 87. H.264 Settings Tab



To configure H.264 settings:

1. Click **Edit** next to the setting you want to modify.

   IMPORTANT! These advanced settings affect the way the encoder performs and if set incorrectly may lead to abnormal encoder operations. Refer to the H.264 Advanced Settings section in Appendix B for suggested values for the type of video you are streaming.

2. Change the **Value**.

3. Click **Update**.

4. Click the **Restore Defaults** link at the bottom of the window to return the settings to the defaults.

   *Note: The database has seven custom presets. Clicking **Restore Defaults** for one profile will change all profiles back to the default settings.*

Editing a Windows Media encoder

When you create a new encoder, the Encoder Properties window appears. The Encoder Properties windows for editing a new encoder or an existing encoder are identical. You must configure the video and audio settings for each encoder type.

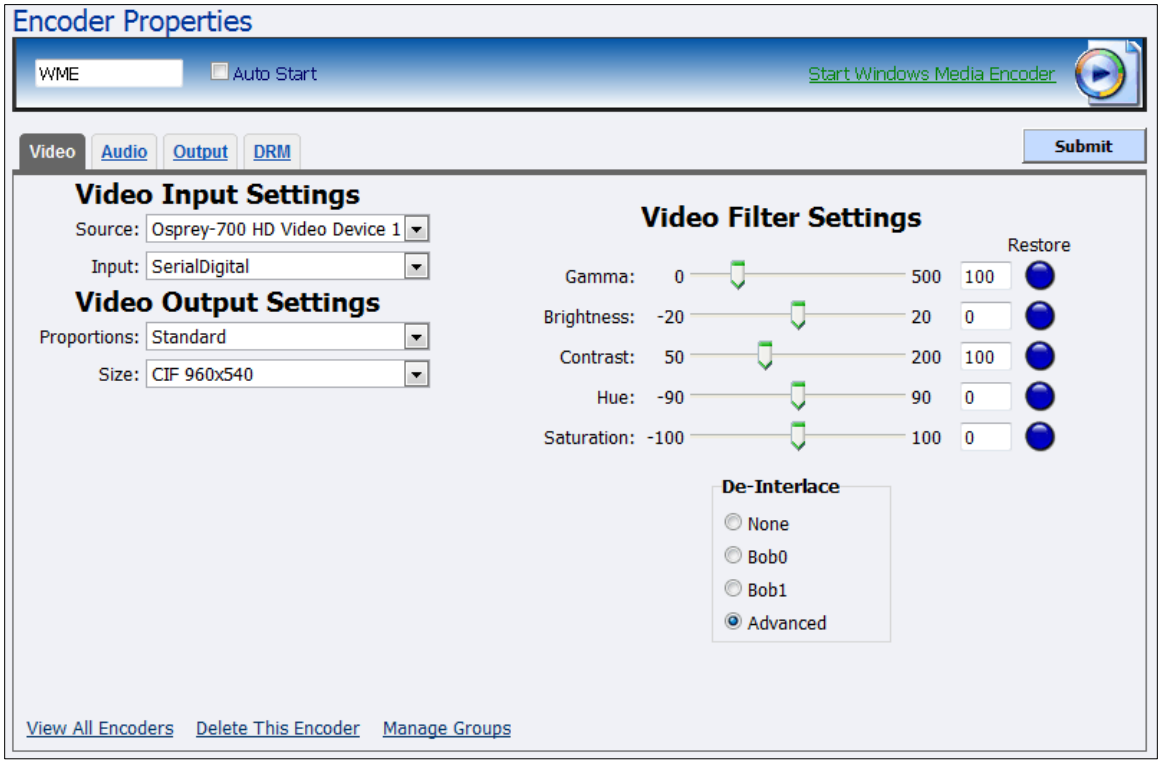
Use the Video, Audio, Output, and DRM tabs to edit the settings. If you plan to change the Windows Media capture profile, use the Output tab first. Changes on the Output tab can adjust other settings automatically. Configure the video and audio settings then the streaming properties. The streaming properties and advanced streaming settings are different for each type of encoder.

From the Windows Media Encoder Properties window (Figure 88), you can set the encoder to start streaming automatically by enabling **Auto Start**. You can also start this encoder from this window by clicking the **Start Windows Media Encoder** link at the top right corner of the window.

Click **Encoders ➢ All Encoders** from the home page. Then select the **Edit** link next to the Windows Media encoder whose properties you wish to modify. The system displays the Encoder Properties window for the selected encoder.

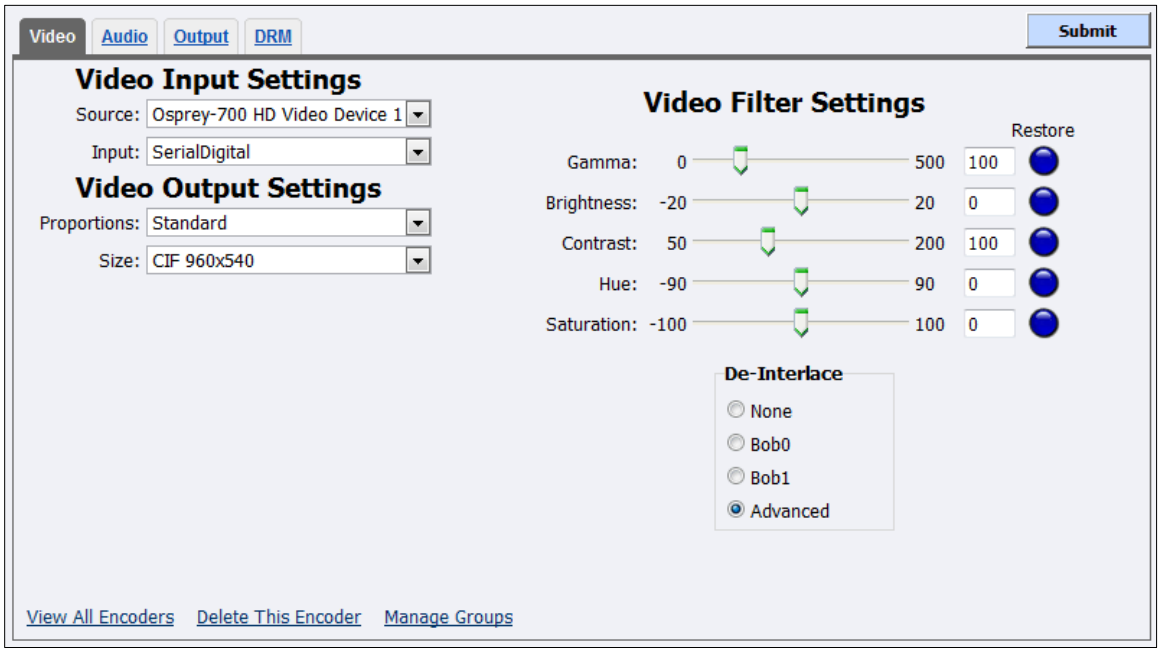
*IMPORTANT! If you make any changes to the Encoder Properties window, you must click **Submit**. Otherwise, all your changes will be lost.*

Figure 88. Windows Media encoder properties



Video tab

Figure 89. Video tab



To configure video settings:

1. In the **Source** field, select **Disabled** or **Osprey-700 HD Video Device 1**.

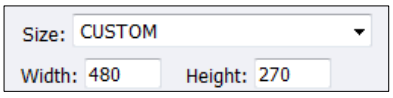
   Note: Because the Niagara 4100 is a single-channel encoder, you can only connect and stream one audio and video source at any given time. However, you can encode the same audio and video at multiple data rates and multiple formats to provide the best user experience for different viewing audiences.

2. In the **Input** field, the video input is **SerialDigital**.
3. The **Proportions** field setting is **Standard** (square pixels for a VGA monitor).
4. In the **Size** field, select the pixel size of the encoded video. The standard sizes include:
   - HD 1280x720
   - CIF for video scaled from full-size to ¼ size
   - QCIF for video scaled from full-size to ¼ of CIF size
   - Custom

   Customization is useful when you are capturing video to be played on a mobile video-device that requires a non-standard size for compatibility.

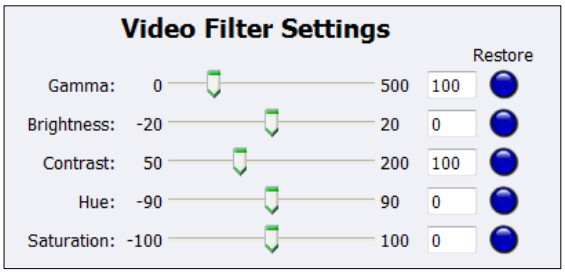
   When you click **Custom**, two additional fields appear so you can enter the exact size you want the resulting video to be (Figure 90).

   Figure 90. Custom fields

5. Drag the sliders to adjust the **Gamma**, **Brightness**, **Contrast**, **Hue**, and **Saturation** (Figure 91).

Figure 91. Video filter settings

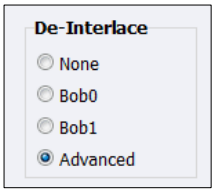


*Note: Click **Restore** to the right of each filter to return the setting to the default.*

6. Click the **De-Interlace** settings you want to apply (Figure 92). Options include:

- **None**
  – Performs no de-interlacing of any kind.
- **Bob0**
  – Applies inverse telecine de-interlacing to all telecine video.
  – Applies motion adaptive de-interlacing to all video that is not telecine.
  – Switches dynamically between the two modes as the content changes.
  – Available for NTSC video only.
- **Bob1**
  – Drops the redundant fields and reassembles the video in a 24 fps progressive format.
  – Applies inverse telecine de-interlacing to all telecine video.
  – Performs no de-interlacing of video that is not telecine.
  –Available for NTSC video only.
- **Advanced**
  – Is an algorithm for de-interlacing pure video (non-telecine) content.
  – Applies motion adaptive interlacing to all video. It detects which portions of the image are still and which portions are in motion then applies different processing to each scenario.

Figure 92. De-Interlace Settings

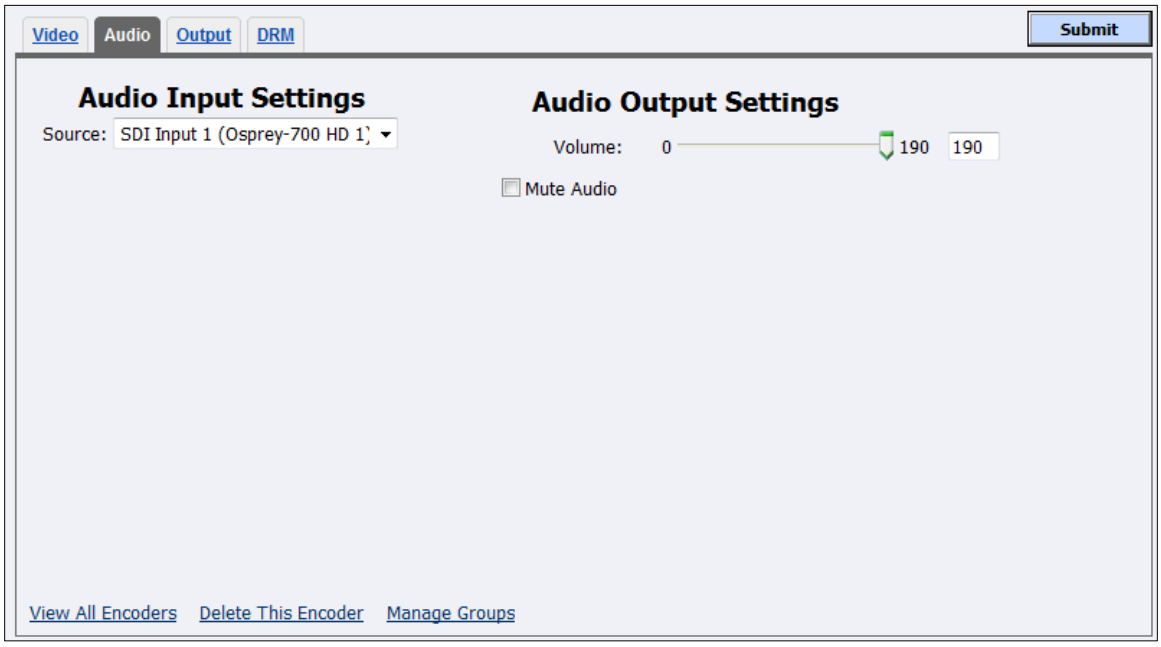


Note: Telecine and inverse telecine only apply to NTSC video. They are not used for PAL and SECAM video. The system disables Bob0 and Bob1 choices when you select either PAL or SECAM as the video standard.

7. Click **Submit**.

Audio tab

Figure 93. Audio tab



To configure audio settings:

1. In the **Source** field, select an audio source from the drop-down list:
   - Disabled
   - AES Input 1 (Osprey-700 HD 1)
   - AES Input 2 (Osprey-700 HD 1)
   - Bal Input 1 (Osprey-700 HD 1)
   - Digital Audio (S/PDIF (High De
   - SDI Input 1 (Osprey-700 HD 1)
   - SDI Input 2 (Osprey-700 HD 1)
   - SDI Input 3 (Osprey-700 HD 1)
   - SDI Input 4 (Osprey-700 HD 1)
   - Unbal Input 1 (Osprey-700 HD 1)

   IMPORTANT! The audio input must match the connectors on the back of the Niagara 4100 and your audio source.
2. Drag the slider to adjust the **Volume**.
3. (Optional) Click the **Mute Audio** checkbox to disable audio.
4. Click **Submit**.

Output tab

Windows Media is both a storage format and a streaming format. In addition to the ability to output to a file, the Windows Media encoder can stream to a Windows Media Server. The settings for Windows Media encoder include the ability to set parameters for connecting and streaming to the server (Figure 94).

Some Windows Media Capture Profiles have pre-defined video resolutions and input selections. When you select a Windows Media Capture Profile, verify your current video and audio settings have not been modified. If they have been modified, simply change these settings back to their previous settings and click **Submit**.

When streaming audio and video, there are two methods of delivery:

- **Pull** – Niagara 4100 begins to generate broadcast packets as soon as you start the encoding. However, it does not deliver the broadcast stream until Windows Media Server requests the stream. This method does not provide a secure connection to the server and should only be used if the encoder and server reside within the same network firewall.
- **Push** – Niagara 4100 maintains a secure connection to Windows Media Server. This connection allows Niagara 4100 to pass a user name and password to authenticate access to the server.

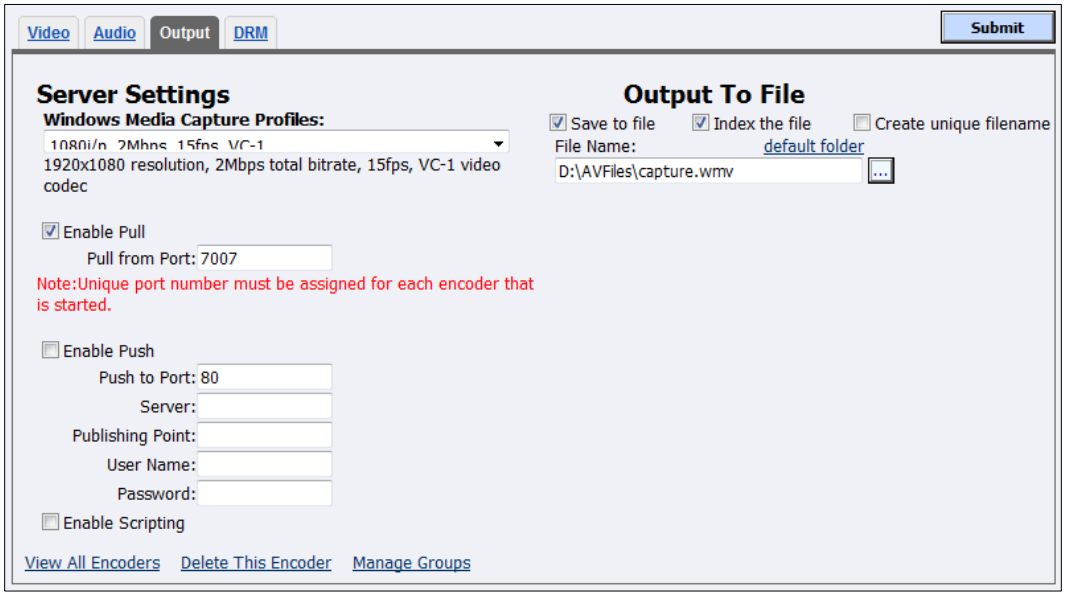
To enable clients to pull the stream from Niagara 4100, set up a session and begin broadcasting directly from Niagara 4100. Clients (Windows Media servers or players) can connect to the stream at any time by using the following URL format:

- http://IP_address:port (for Internet connections)
- http://encoding_computer_name:port (for LAN connections)

By default, Niagara 4100 supports up to 50 direct connections during a broadcast.

Note: The greater the number of direct connections to Niagara 4100, the more system resources is required. ViewCast does not recommend directly connecting players to Niagara 4100. Streaming servers should connect to Niagara 4100 and, in turn, players should connect to the servers.

Figure 94. Output tab



To configure output settings:

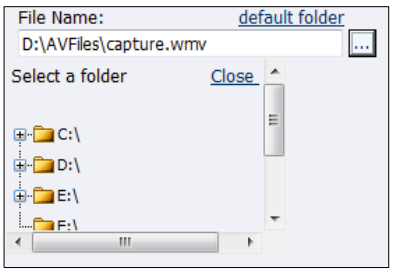
1. Click on a **Windows Media Capture Profile**.
2. Click the **Enable Pull** checkbox.
3. Enter a port number that the server will use to pull the stream from Niagara 4100.
4. Click the **Enable Push** checkbox.

   IMPORTANT! Be sure to enter a port number not already assigned to another encoder. If two encoders attempt to use the same port number, one or both encoders will fail to start.
5. Enter a port number that the server will use to push the stream from Niagara 4100.
6. Enter the **Server** name or IP address.
7. Enter the **Publishing Point**.
8. Enter the **User Name**.
9. Enter the **Password**.
10. Click the **Enable Scripting** checkbox to embed closed captions.

    Note: If closed captions is enabled through the Osprey 700e HD driver, you cannot enable scripting.
11. You can:
    - Click the **Save to File** checkbox to save the encoded content to a file. Each time you start this encoder, the system overwrites the previous file.
    - Click **Index the file** to drag the slider to any point in your video capture.
    - Click **Create unique file** to create a file that the system does not overwrite.
12. Accept the default location that displays in the **File Name** field or choose your own location for the file. To choose your own personal location select the link (horizontal ellipses or …) to the right of the **File Name** field and display the options (Figure 95).

    Note: By default, the system sets this folder to D:\AVFiles\ with a default file name of capture.xxx. See Exporting captured video files *for instructions on saving video files to a USB device.*

Figure 95. Select a folder



WARNING! ViewCast strongly recommends you do not alter the default directory setting unless you fully understand the risk of saving your files to a directory not located on drive D. If you save your files to another drive on the Niagara 4100, the system could delete the files when you use the Restore to Niagara 4100 Factory Defaults feature.

Only drive D on the Niagara 4100 has available storage to save your files. Check drive properties for available free space to determine your storage capacity.

Use drives C, E, and F strictly for Niagara 4100 operational programs. Any modifications to these drives can permanently damage your system and void your warranty.

A better practice would be to use the streaming server to save a file or to save it to a remote drive. If you inadvertantly fill all available space, you risk losing your stream during a streaming event.

13. Click **Submit**.

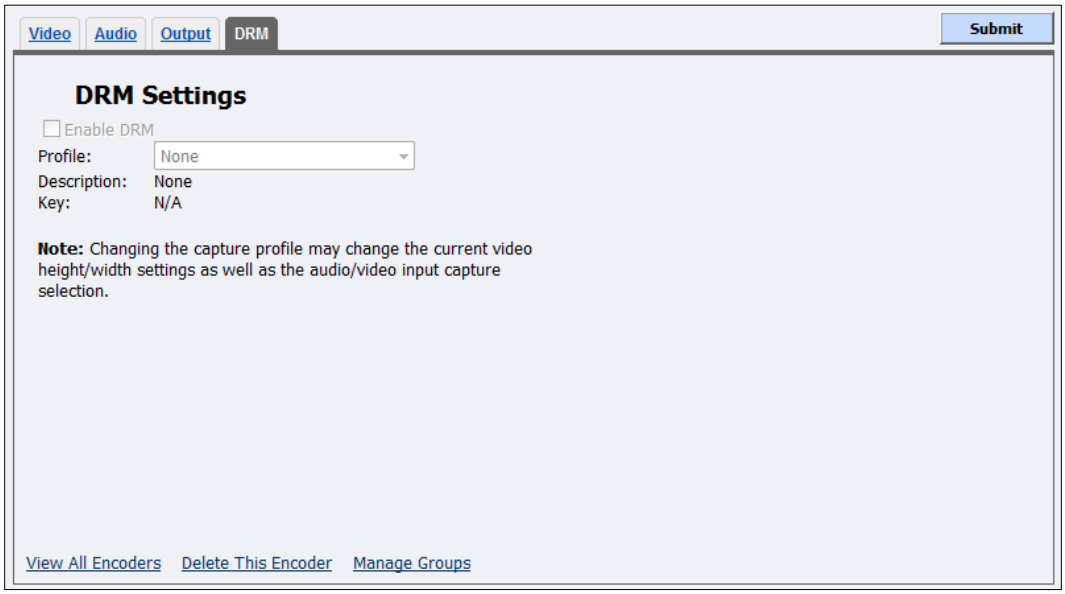
*Note: If you click to another window before you click **Submit**, your changes will be lost.*

DRM tab

You can protect your content using a technology called Digital Rights Management (DRM). Niagara SCX allows you to encrypt your content with DRM technology while you are encoding. You can apply DRM while encoding to a file and when broadcasting a stream. Users are required to obtain a license to play to content. This license contains the key to unlock the content and the rights that govern its use (Figure 96).

Refer to *Appendix A* on how to set up and import a DRM profile.

Figure 96. DRM tab



To configure DRM settings:

1. Click the **Enable DRM** checkbox.
2. Click the DRM **Profile** you wish to apply from the drop-down list.

   Note: When you enable DRM, Niagara SCX automatically changes the Windows Media Capture Profile setting to a DRM-compatible Windows Media 9 setting. You may need to adjust this setting after you enable DRM.
3. Click **Submit**.

Viewing encoder groups

Encoder groups represent the cornerstone for streaming on the Niagara 4100. The Niagara 4100 comes with several default encoders and profiles. You must have at least one group assigned on the Niagara 4100 and one encoder profile assigned to that group. The **Preset ABC** buttons on the appliance remain unusable until you have this minimum configuration.

The **Encoder Groups** window (Figure 97), a subset of **Encoders** (on the Encoders window), allows you to view the list of encoder groups available for assignment to the Niagara 4100. Click **Encoders** ➢ **Groups** from the menu bar on the home page.

Figure 97. Encoder Groups window

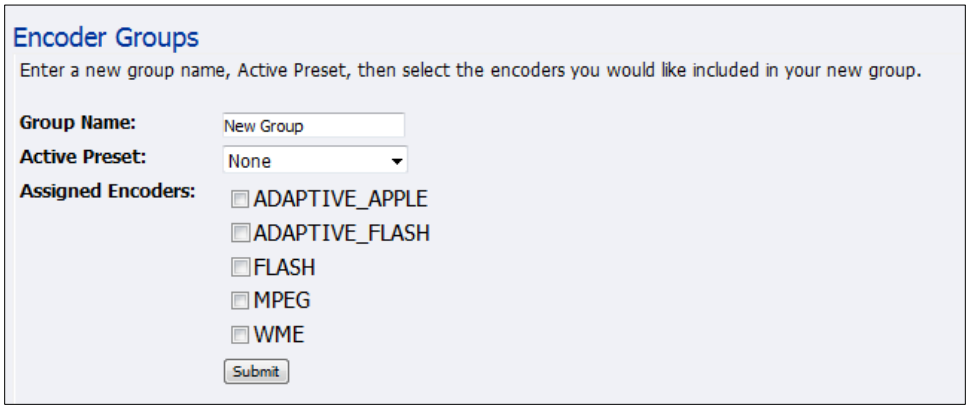
A	Indicates the CPU usage.
B	Allows you to create a new group.
C	Indicates the total number of groups on the Niagara 4100.
D	Allows you to edit a group.
E	Allows you to delete a group.
F	Displays the name of the group.
G	Indicates which preset button is assigned to this group.
H	Indicates the encoders assigned to this group.
I	Allows you to start this group.
J	Allows you to stop this group.

Creating encoder groups

If two encoders try to use the same port number at the same time, an error will occur.

Select the **Create New Group** link on the **Encoder Groups** window. The encoder groups fields display (Figure 98).

Figure 98. Encoder Groups window



To create encoder groups:

1. Enter the name of the group.
2. Click on the preset button you want to assign to this encoder group.
3. Click on the encoders you want to assign to the group.
4. Click **Submit**.

Note: It is possible to assign one encoder to two different encoder groups.

Starting an encoder group

To start an encoder group, click the **Start** link to the right in the **Start** column of the group you want to start. The encoder group will start in a few seconds. The system displays any errors on the Starting window while the group starts.

Note: With each encoder started, more system resources (CPU cycles) are consumed. It is recommended that the total CPU threshold not exceed an average of 70 %. Refer to the Checking CPU usage section in Basic Operations.

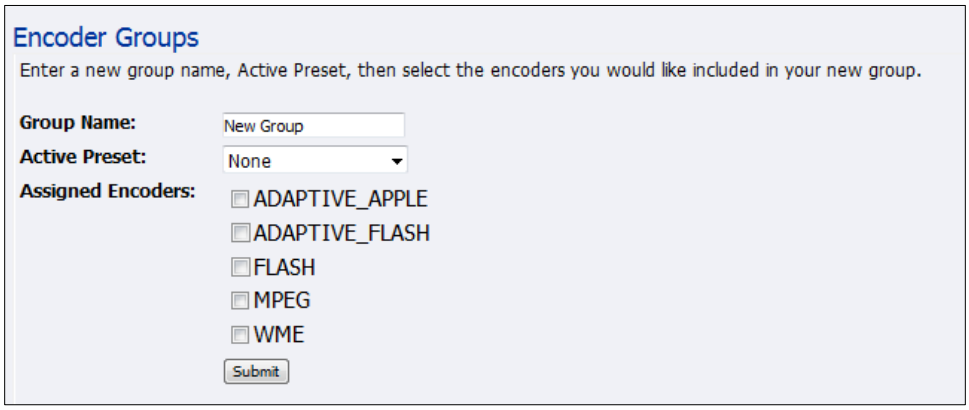
Stopping an encoder group

To stop an encoder group, click the **Stop** link to the right in the **Stop** column of the group you want to stop. The encoder group will stop in a few seconds. The system displays any errors on the Stopping window while the group stops.

Editing encoder groups

Select the **Edit** link on the **Encoder Groups** window. The encoder groups field displays (Figure 99).

Figure 99. Encoder Groups Window



To edit encoder groups:

1. Enter the name of the group.
2. Click on the preset button you want to assign to this encoder group.
3. Click on the encoders you want to assign to the group.
4. Click **Submit**.

Configuring the Preset ABC buttons

The Niagara 4100 streaming media appliance provides one-button streaming via the Preset ABC buttons located on the front panel of the system. By default, these buttons are not assigned. Use the web interface to configure or preset each button to a specific group of encoders. (A preset is a quick way to select and stream a group of encoder profiles.) Before you can configure the Preset ABC buttons, you need to configure groups. The controls to configure these buttons are on the **Encoder Preset A**, **Encoder Preset B**, and **Encoder Preset C** windows. Each window shows a graphic representation of the front panel of the Niagara 4100.

An **Edit Encoder** link appears next to the **View All Encoders** link at the bottom of the window if an encoder is assigned to this button.

To begin configuring the Preset ABC buttons, on the home page click **Encoders ➢ Preset A.** The **Encoder Preset A** window appears.

Figure 100. Encoder Preset A window

To assign Preset A button:

1. Click the drop-down list in the **Select a Group** field. A complete list of all groups available on the Niagara 4100 appears.
2. Select a group.
3. Click **Submit**.

   The Encoder Preset A window updates with the encoder information (Figure 101).

Figure 101. Select Encoder

Note: The A button in the graphic is highlighted to show an encoder is assigned to this button.

4. Repeat steps one through three to set an encoder for the B and C buttons.

Using Preset ABC buttons to start an encoder group

Use the **Preset ABC** buttons on the front panel to start the assigned encoder group.

To use preset buttons to start encoding:

1. Press the **A**, **B**, or **C** button on the front panel.
2. Press **Stream** to start encoding. The indicator light next to the preset button displays to indicate a positive video stream and the audio meters display to indicate positive audio tracking.

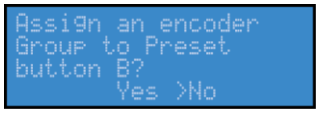
   WARNING! Limitations exist for the number of streams you can encode simultaneously. If you attempt to encode more streams than the Niagara 4100 can process simultaneously, the streams drop frames and the video stutters. This results in a poor viewer experience. If you fail to reduce the number of sessions to reduce CPU load, unexpected system behavior could occur.
3. If you press a Preset button and no encoder groups are assigned to this button, the no encoders screen appears (Figure 102).

   Figure 102. No encoders screen

   Press **Enter**. The assign an encoder screen appears (Figure 103).

   Figure 103. Assign an encoders screen

   Note: You must define encoder groups before you can assign them to a Preset button.
4. Use the **Up** and **Down** arrows to select **Yes**.
5. Press **Enter**. The select group screen appears (Figure 104).

   Figure 104. Select group screen

6. Press **Enter**. A screen with the list of available groups appears (Figure 105).

   Figure 105. Group screen

7. Use the **Up** and **Down** arrows to select the appropriate group.
8. Press **Enter**. A confirmation screen appears (Figure 106).

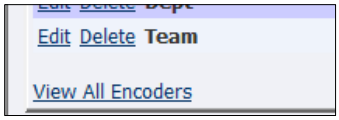
Figure 106. Confirmation screen

9. Press **Enter**. A group is now assigned to the Preset button.

Viewing all encoders

After assigning encoders to the **A**, **B**, and **C** buttons, the system updates the **Preset** column on the Encoder Groups window to reflect these changes. To view these changes, select the **View All Encoders** link at the bottom of the Encoder Groups window (Figure 107).

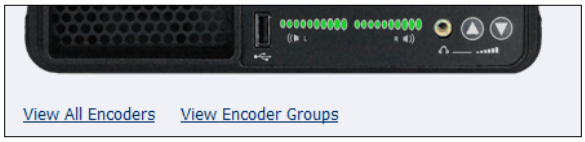
Figure 107. View All Encoders



Editing preset encoders

After assigning encoders to the **A**, **B**, and **C** buttons, you can access the Encoder Properties window by clicking on the **View All Encoders** link at the bottom of the **Preset** window (Figure 108).

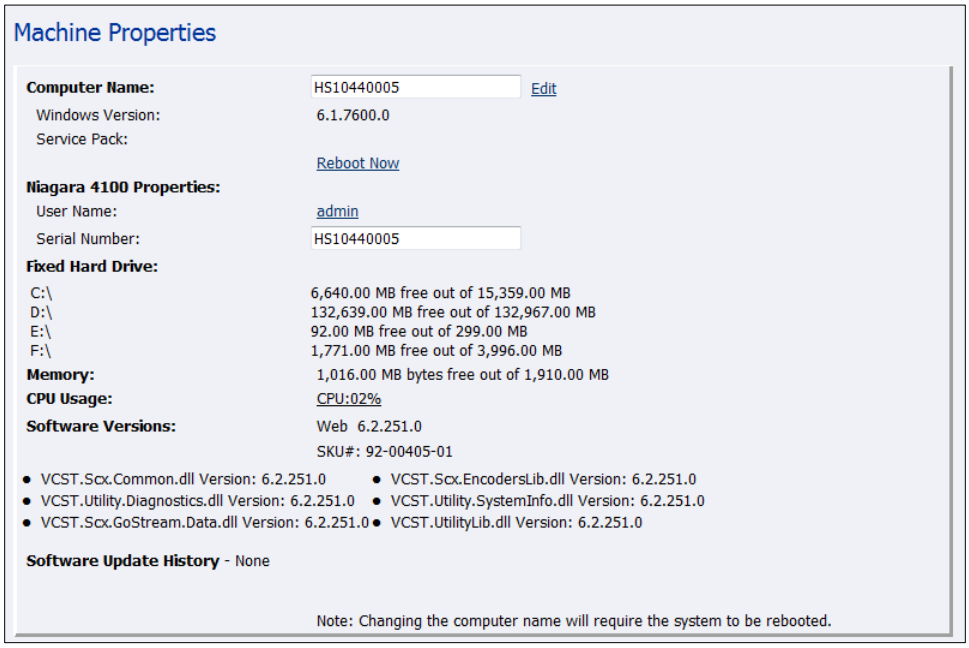
Figure 108. Editing Preset Encoders



Configuring machine properties

The Niagara 4100 **Machine Properties** window (Figure 109) provides details on software versions, network name, serial number, and hard drive configurations. Click **Configuration ➢ Surf Properties** from the menu bar on the home page.

Figure 109. Machine Properties window



Most of the data on this window provides information only and users cannot alter it. However, you can modify two fields:

- Computer Name
- Admin password

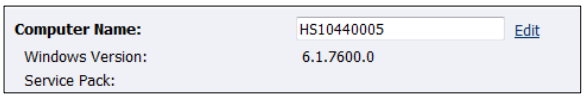
Changing the computer name

The **Computer Name** field contains the current network name for the Niagara 4100. This name is the same name you typed into the web browser to access the Niagara SCX web interface.

To change computer name:

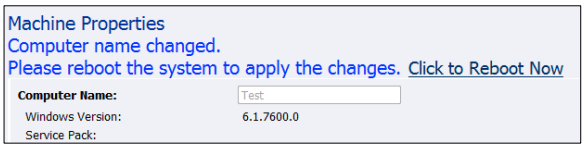
1. Click the **Edit** link next to the **Computer Name** field (Figure 110).

   Figure 110. Computer Name field

2. The screen refreshes and the **Computer Name** field becomes an editable text field. Type in a new name for the Niagara 4100.
3. Click **Submit** at the bottom of the page. The page refreshes, and the system prompts you to reboot the Niagara 4100. Your changes do not take effect until the system restarts (Figure 111).

   Figure 111. Reboot message

4. Click the **Click to Reboot Now** link to restart the system and apply the **Computer Name** change.

   Note: The restart process takes several minutes to complete.

   When the Niagara 4100 restarts, use the new system name in the IE browser URL to return to the Login window.

   If you close your web browser and later want to log into the web interface, you must use the new computer name you created or the IP address of the appliance to access the Niagara 4100.

Changing the login password from the factory default

The Niagara 4100 Properties section has two fields: **User Name** and **Serial Number**. Only the **User Name** field can be changed, which changes the **User Password** from the factory default (Figure 112).

Figure 112. Properties section

To change login password

1. Click the **admin** link in the **User Name** field.

   Note: The system displays a new window (Figure 113) that allows you to change your login password for the web interface.

   Figure 113. Password Change window

   Note: You cannot change the User Name for the web interface from this window.

2. Type your current password in the **Password** field. Continue by typing your desired new password in both the **New Password** and **Confirm New Password** fields. The web interface password is case sensitive.
3. Click the **Change Password** button. The system displays a confirmation page. You must log back into the web interface with your password.

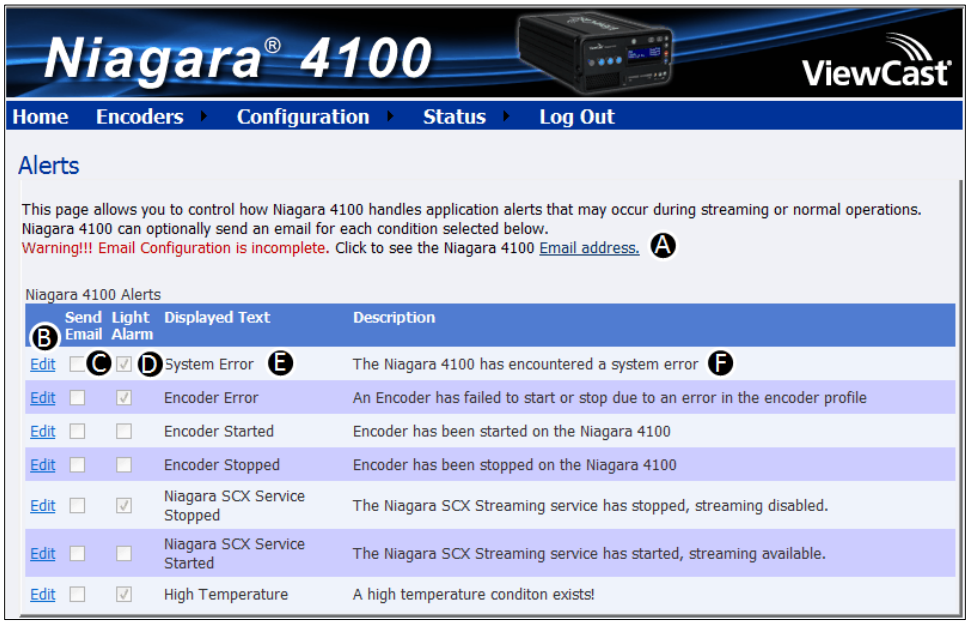
Restoring the login password to the factory default

If you forget or lose your password, you can restore the default password by running the **Restore SURF Factory Defaults** option. For more information, see *Restore Niagara 4100 Factory Defaults* in the *System Configuration* section later in this chapter.

Configuring Alerts

Click **Configuration** ➢ **Alerts** from the menu bar on the home page. The Alerts Window (Figure 114) allows you to configure alerts for different situations that may occur during streaming or other operations.

Figure 114. Alerts window

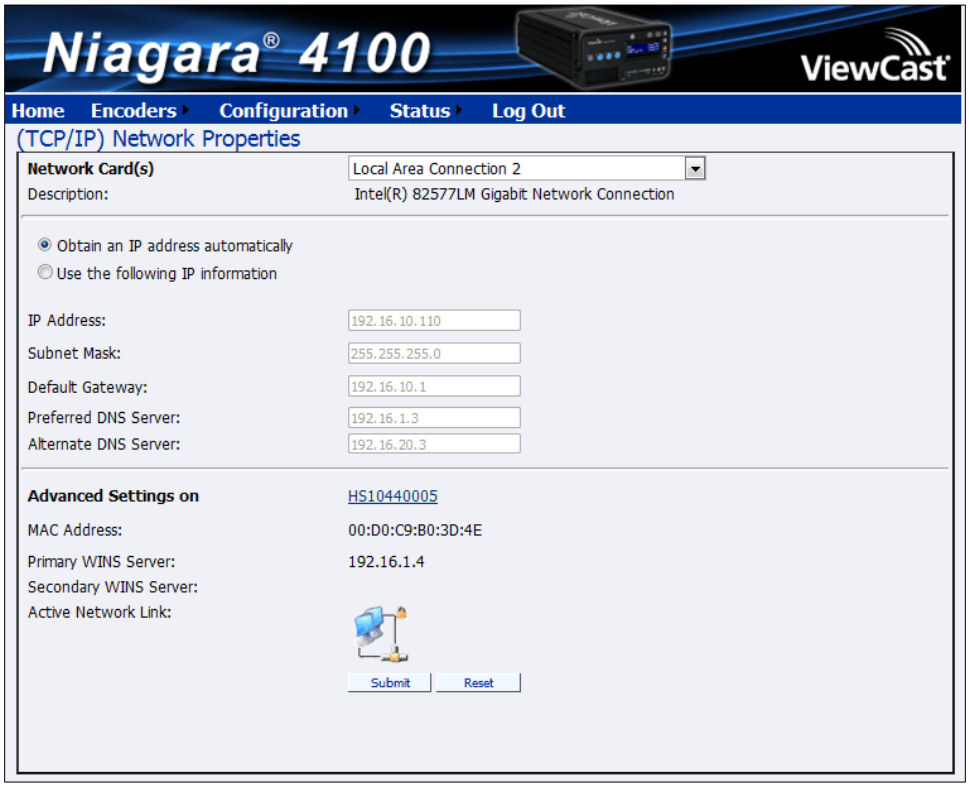


A	Click the **Email address** link to configure email settings on the System Configuration Settings window.
B	Click the **Edit** link next to the alert you want to change settings on.
C	Click the **Send Email** checkbox to send an email to multiple recipients should an alarm occur. *Note: You can optionally send an email alert to specific email address in the event of an application alarm. You must specify the email address where you want an alert sent, along with your email server user name, password, and server name. For more information about configuring the Niagara 4100 to send email alerts, see the System Configuration section.*
D	Click the **Light Alarm** checkbox. The alarm light on the front panel of the Niagara 4100 will automatically light when an alarm condition exists.
E	Displays the type of alert.
F	Provides a description of the type of alert.

Configuring network properties

The **Network Properties** window (Figure 115) provides detailed information on the current network settings for the Niagara 4100 **Network Cards**. Click **Configuration** ➢ **Network Properties** from the menu bar on the home page.

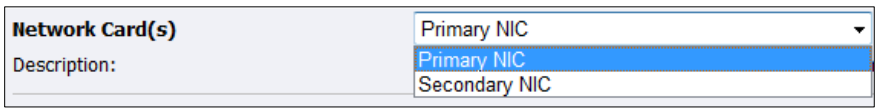
Figure 115. Network Properties window



Configuring network cards

The Niagara 4100 has two 1 Gbit network connections available on the Network Properties window, **Network Card(s)** field). Select the card you wish to view from the drop-down menu in the **Network Card(s)** field (Figure 116) to view the current properties for each card.

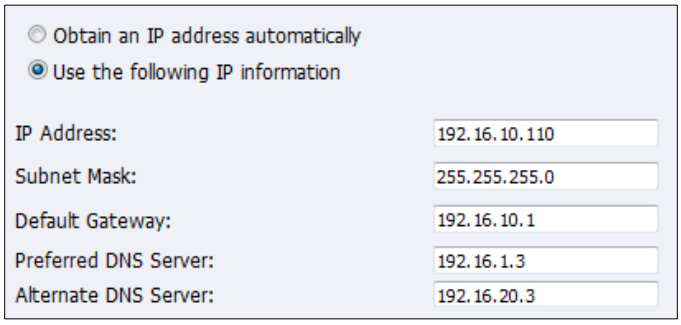
Figure 116. Network Card options



Configuring the IP address

Depending on your system configuration, you may need to configure the **IP Address** (Figure 117).

Figure 117. IP Address



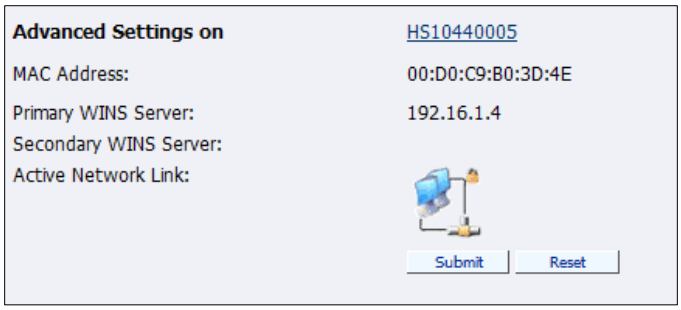
To configure IP address:

1. Click the **Use the following IP information** checkbox.
2. Enter the appropriate information in the **IP Address**, **Subnet Mask**, **Default Gateway**, **Preferred DNS Server** and **Alternate DNS Server** fields.
3. Click **Submit**.

Configuring advanced network settings

Advanced network settings provide the Niagara 4100 network name, MAC Address, and server IP address settings (Figure 118).

Figure 118. Advanced Settings



The Niagara 4100 network name (HS10440005) is a link. If you click this link, the system transfers you to the Machine Properties window. From this window, you can change the name of the Niagara 4100.

The **Active Network Link** field uses one of two icons to indicate whether the network interface card selected has a network connected.

The system detects the network link.

The system does *not* detect the network link.

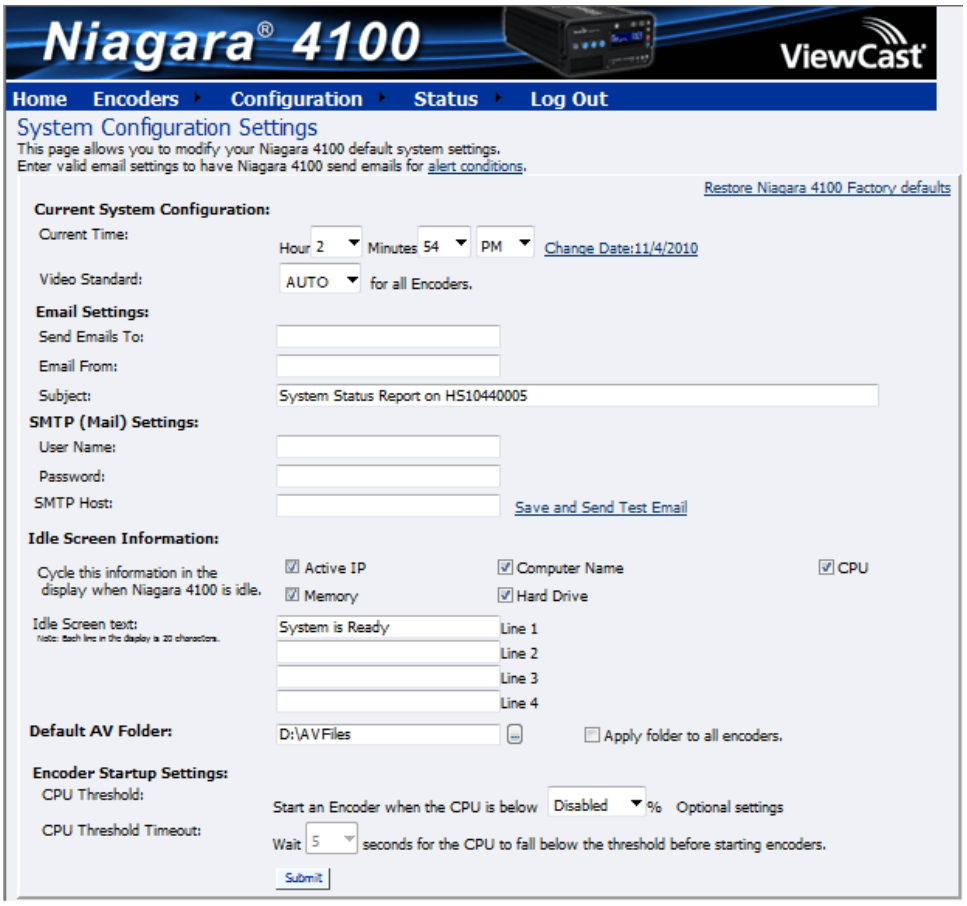
System configuration settings

The **System Configuration Settings** window (Figure 119) allows you to modify your Niagara 4100 default system settings. You can configure email settings to enable Niagara 4100 to send an email to predefined email addresses any time the Niagara 4100 appliance encounters an alert condition. You can also customize the information the Niagara 4100 displays on its front panel when the system is in idle mode.

This window also allows you to restore your Niagara 4100 to its original factory disk image and return all the system settings to their original states. Using the **Factory Restore** option removes all custom settings. It takes approximately 15 to 40 minutes to complete.

Click **Configuration** ➢ **System Configuration** from the menu bar on the home page.

Figure 119. System Configuration Settings window



Setting current system configuration

You can set the current time, date, and the video standard for all encoders (Figure 120).

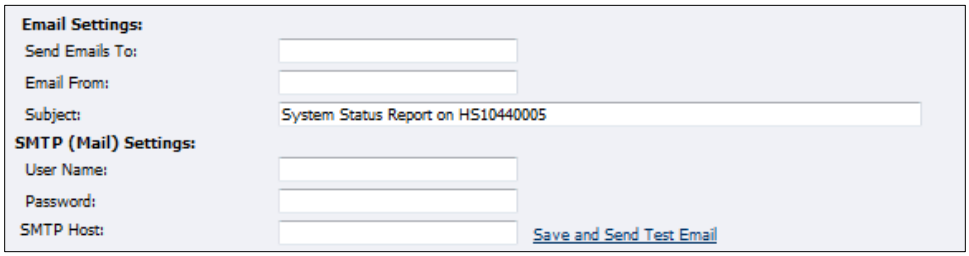
Figure 120. Current System Configuration

To set current system configuration:

1. Click the **Hour** in the drop-down list.
2. Click the **Minutes** in the drop-down list.
3. Click **AM** or **PM** in the drop-down list.
4. Click the **Change Date** link. A calendar appears.
5. Click the date on the calendar.
6. The Osprey 700 automatically defines the **Video Standard**.
7. Click **Submit**.

Configuring email/SMTP settings

Figure 121. Email/SMTP Settings fields



To configure email settings:

1. Enter the email address you want the system to send the email. Separate multiple email addresses with a comma.
2. Enter a valid originating email address.
3. Enter a subject line for your email alert.

To configure SMTP (mail) settings:

1. Enter the SMTP user name for server access.

   Note: If you are unfamiliar with setting up an SMTP email account for sending email, contact your network administrator for assistance.

2. Enter the password if required.

   Note: For security purposes, the password for your account does not display once the system enters it into the Niagara 4100 settings. Although this field appears blank after you click Submit, the system retains the password information.

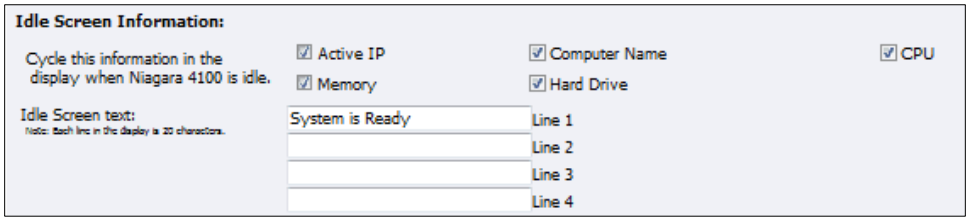
   If you change any information in this dialog box, you need to re-enter your SMTP password before clicking Submit. Not doing so overwrites the previously entered password with a blank entry.

3. Enter the name of the SMTP server.
4. Click the **Save and Send Test Email** to test your settings. The resulting window reports the email as successful or it sends information that a send failure occurred.
5. Click **Submit**.

Configuring idle screen information

You can modify the information displayed in the Niagara 4100 LCD display on the touch panel. The information you select cycles through the LCD display screen and alternates between status and encoder information (Figure 122).

Figure 122. Idle Screen Information



To configure idle screen information:

1. Click the checkboxes next to the information you wish the screen to display.
2. The default text for Line 1 is **System is Ready**. Enter the message you wish to appear.
3. Enter the text you want to appear in **Lines 2**, **3**, and **4**.
4. Click **Submit**.

Configuring default directory setting

The Niagara 4100 stores AV files when you select the **Save to File** option in the Output tab of the encoder profile in the **Default AV Folder** field (Figure 123). Refer to the **Save to File** option under the Flash Encoder Properties sections for information on setting an encoder profile to create an AV file.

Note: ViewCast strongly recommends you do not alter the default directory setting unless you understand the risk of saving your files to a directory not located on drive D. If you save your files to another drive on the Niagara 4100, the system could delete the files when you use the Restore to Niagara 4100 Factory Defaults feature.

Only drive D on the Niagara 4100 has available storage to save your files. Check the drive properties for available free space to determine your storage capacity.

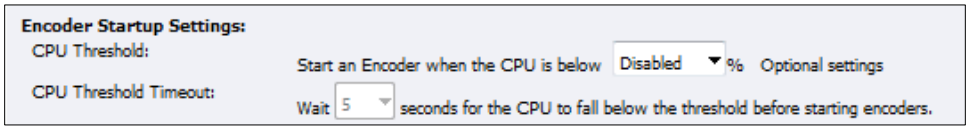
Use drives C, E, and F strictly for the Niagara 4100 operational programs. Any modifications to these drives can permanently damage your system and void your warranty.

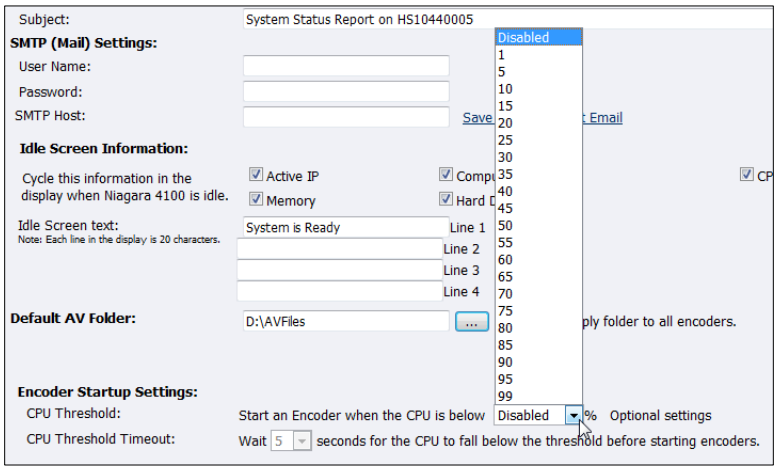
Figure 123. Default AV Folder field

Setting CPU thresholds

You may set the **CPU Threshold** field (Figure 124) to accommodate optimal encoding capabilities. You also may set the time between repetitive intervals for checking the CPU threshold.

Figure 124. Encoder Startup Settings





Note: ViewCast recommends a CPU threshold setting of 70 % or lower.

Restoring Niagara 4100 factory defaults

The **Restore Niagara 4100 Factory defaults** link allows you to restore drive C to its original factory system defaults. This action removes all data (including stored files) on the primary drive and reinstalls the original factory image.

Note: Select this option only if you wish to return your system to its factory defaults. Selecting this option erases all data currently stored on drive C and stops all currently running programs. Remove any USB memory device before performing a Factory Restore.

This operation takes approximately 15 to 45 minutes to complete. Do *not* power off or interrupt the system restore once it starts. All services automatically restart when the system restore completes. You may then use the Niagara 4100 web interface tool to reset the time, date, and video format.

Click the **Restore Niagara 4100 Factory defaults** link on the **Configuration ➢ System Configuration Settings** window to start the process. The resulting window (Figure 125) allows you to return to the home page, thereby cancelling this action, or continue with the restore action.

Figure 125. Restore Factory Defaults window

The window provides you details regarding the process you are about to execute and allows you the opportunity to once again cancel the process by clicking **Back to Home Page**.

Note: Restore to Factory Defaults rebuilds the Niagara 4100 primary disk drive C with the original system image. You lose all custom settings and any files saved to drive C. You cannot reverse this process. However, you can manually re-enter your custom settings once the Niagara 4100 restore process completes.

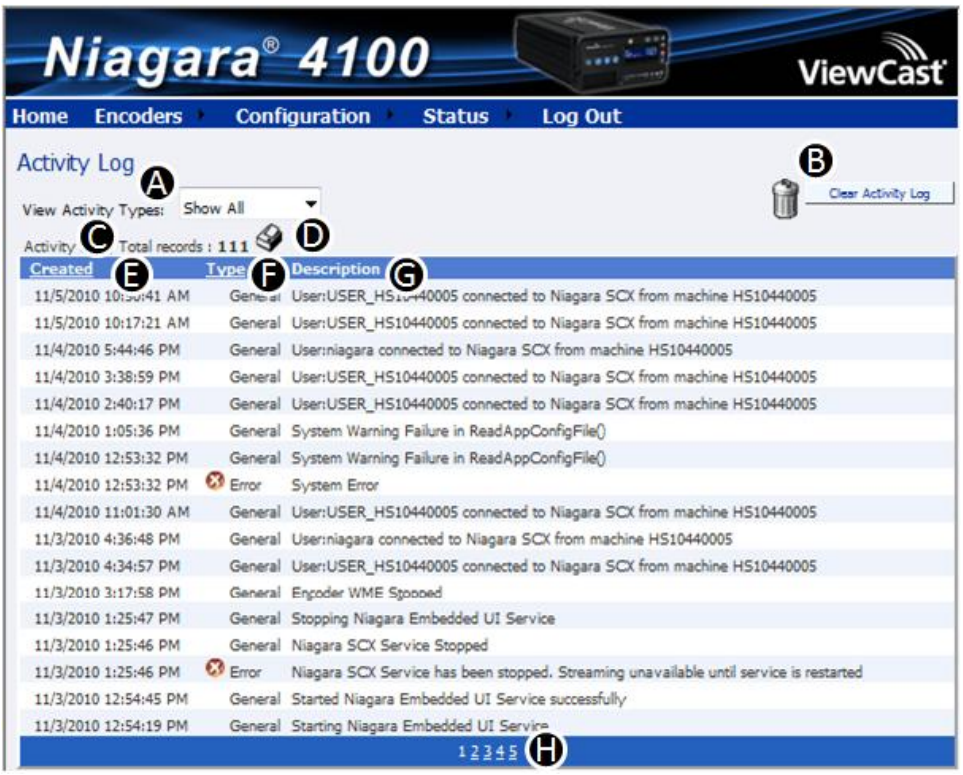
Use the default directory, D:\AV Files\, for saving your audio and video files. The system only re-images drive C when you use the Restore Factory Defaults option. It preserves all files and folders on drive D. Always use the default directory – drive D – for storage of personal files to ensure the system does not remove your personal files.

IMPORTANT! Remember that the system deletes all previously stored encoder profiles and groups when you restore it to its factory defaults unless the checkbox to save profiles is checked.

Viewing the activity log

The Activity Log records the encoder Start and Stop events (Figure 126). The system updates the log for every event including the date and time. To view the activity log, on the home page click **Status ➢ View Activity Log.**

Figure 126. Activity Log window

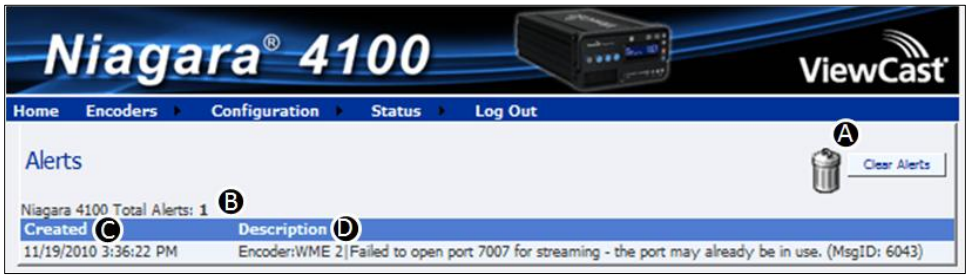


A	Select the types of activity you wish to view. Options include: • Show All • General • Errors • Warnings
B	Click this link to clear all logged activities.
C	Indicates the number of records for the selected view type.
D	Click the icon for a print view of the activity log. When the print friendly view appears, click **File ➢ Print** to print a hard copy or save a soft copy of the Activity Log.
E	Displays the system date and time stamps for each event.
F	Indicates the type of activity.
G	Displays a description of the activity.
H	Click to view multiple pages of activity log.

Viewing alerts

Click **Status** ➢ **View Alerts** from the home page. The Alerts Window (Figure 127) updates with every alert event on the Niagara 4100. The alerts include any specific alert events for the encoder.

Figure 127. Alerts window



A	Click this icon to clear all alerts.
B	Indicates the number of alerts.
C	Displays the date and time the alert occurred.
D	Displays the description for the alert.

The Alarm Indicator Light on the front panel of the Niagara 4100 turns red when an alert occurs. Press the "**i**" button to view the alert (see *Niagara 4100 front panel diagram*).

Connecting an external storage device

The Niagara 4100 provides two USB ports, one on the front panel and one on the rear panel. You can connect almost any standard USB memory device to one or both of these ports. This allows you to export any AV files you created on the local storage drive of the Niagara 4100. The encoder defaults to set the local storage drive D when you use the **Save to File** setting with the Niagara 4100 web interface.

When you insert a USB memory device in one of the USB ports on the Niagara 4100, the Niagara 4100 automatically detects the removable storage device, and assigns a drive letter to the device. Use standard Windows methods to transfer AV files from drive D to the attached USB device.

Using the Niagara SCX web interface

You may wish to perform even more advanced setup and operations. To do so, you may choose to access the Niagara SCX web interface. You may access the Niagara SCX web interface through a remote desktop connection or by connecting a monitor, keyboard, and mouse to the Niagara 4100. Use the *Niagara SCX User Guide* for specific information on how to use the Niagara SCX and the Niagara SCX Explorer software.

Appendix A: DRM for Windows Media

You can protect your content using a technology called Digital Rights Management (DRM). Niagara SCX allows you to encrypt your content with DRM technology while you are encoding. You can apply DRM while encoding to a file and when broadcasting a stream. Users will be required to obtain a license to play the content. This license contains the key to unlock the content and the rights that govern its use.

Note: Licenses are issued by a third-party license provider, so you must set up an account with a third-party license provider to protect your content.

Niagara SCX automatically detects any available DRM profiles imported on the encoding system. If no DRM profiles are installed, the DRM functions in Niagara SCX are disabled. To enable the DRM function in Niagara SCX, you must do the following:

- Set up an account with a third-party license provider and create a DRM profile.
- Import the DRM profile using the Windows Media Encoder application included with Niagara streaming appliances or available as a free download from Microsoft Corporation (http://www.microsoft.com).
- Restart the unit on which Niagara SCX is installed, allowing the software to auto-detect and enable its DRM functions.

Importing a DRM profile

If you have not already done so, set up an account with a licensed provider and create a DRM profile. Once you create the DRM profile, you must use Windows Media Encoder to import the profile on the encoding system.

Windows Media Encoder is included in Niagara streaming media appliances that have Niagara SCX version 5.0 or later installed. To access the desktop of the Niagara 4100, attach a keyboard, a mouse, and a monitor to the system. If the system is installed in a location that does not provide physical access, you can use Windows Remote Desktop Connection to access the desktop.

*IMPORTANT! When connecting to a Niagara 4100 using a remote desktop connection, it is extremely important you set the **Local Resources** to **Leave at remote computer** before connecting to the system.*

To open a remote desktop connection:

1. Open the Remote Desktop Connection (Figure 128).

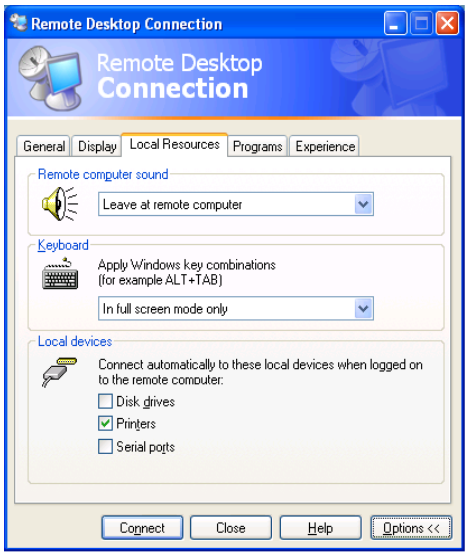
   Figure 128. Remote Desktop Connection

2. Click **Options**. The setting tabs display.
3. Click the **Local Resources** tab.

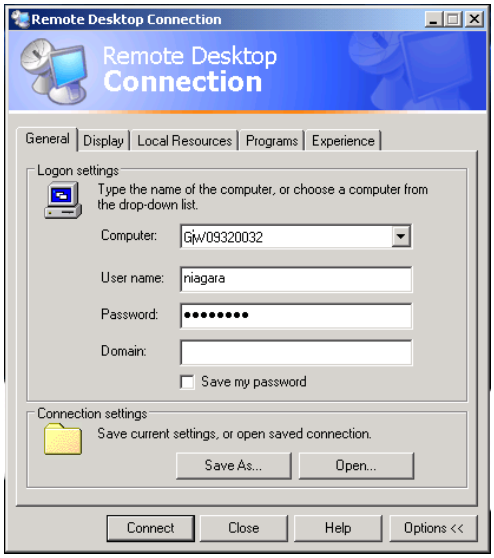
4. Under **Remote computer sound**, click **Leave at remote computer** option from the drop-down list (Figure 129).

Figure 129. Local Resources tab



5. Click the **General** tab (Figure 130).

Figure 130. General tab



6. In the **User Name** field, type **niagara**.

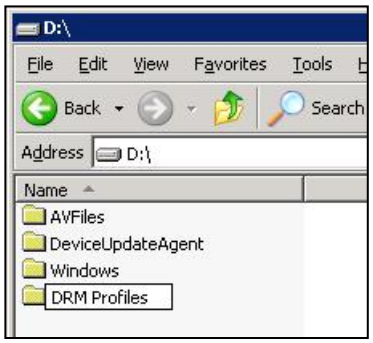
7. In the **Password** field, type password to connect the Niagara 4100 using remote desktop.

WARNING! When exiting from Remote Desktop Connection, do not log off. Instead, exit/close the session from the Niagara 4100. This step allows its internal programs to continue running.

8. Copy the DRM profiles to a protected location on the encoding system to ensure they are not accidentally removed or erased (Figure 131).

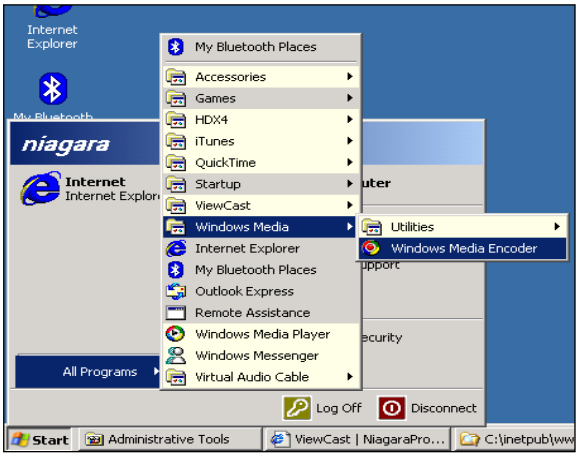
   Note: ViewCast recommends you create a new directory on drive D on the Niagara 4100 and use this directory to store your DRM profiles.

Figure 131. DRM Profiles



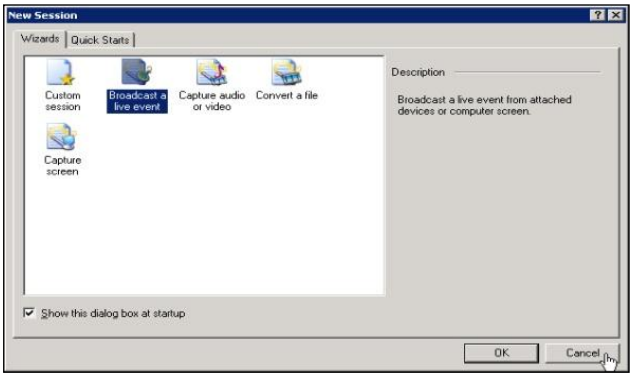
9. Start the Windows Media Encoder application on Niagara 4100 (Figure 132).

Figure 132. Starting Windows Media Encoder



10. When the New Session Wizard displays, click **Cancel** (Figure 133).

Figure 133. New Session Wizard

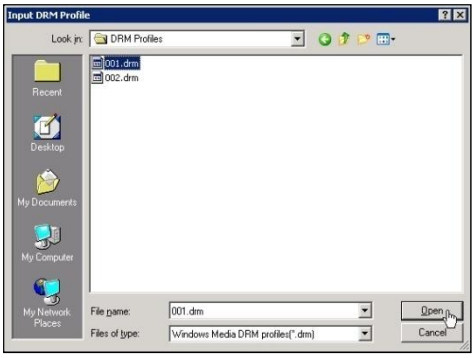


11. Click **Properties** under the top menu bar (Figure 134).

Figure 134. Properties tab

12. Click the **Security** tab.
13. Click **Import** and browse to the location of the DRM profiles on the system's hard drive.
14. Select the DRM profile you wish to import and click **Open** (Figure 135).

Figure 135. DRM Profile



15. Repeat this process for each DRM profile you wish to import.
16. Exit from the Windows Media Encoder application when finished.

Note: If the system prompts if you want to save your encoding session, click ***No option****.*

17. **Disconnect** Remote Desktop Connection from Niagara 4100 (Figure 136). *Do not log out.*

Figure 136. Disconnect Remote Desktop

18. **Restart** Niagara 4100.

Appendix B: H.264 Advanced Settings

In general, the default values for the H.264 encoder will meet your streaming requirements. For devices with restricted bandwidths and under certain conditions such as low bit rates, motion specific, or constant bit rate applications, you may need to adjust the advanced settings. This section includes several examples to assist you in the selection of advanced variables. These examples are suggestions and you should understand and select the appropriate values for your streaming application. See *Settings* for the setting variable.

Setting	Value
BFramesBias	0
BFramesMax	0
BFramesStrategy	0
BitRateTolerance	1
BlurComplexity	20
ChromaOffset	0
CodecFlags	4196352
CodecFlags2	131328
CoderType	0
DirectMVPrediction	1
GOPSize	250
GOPSizeMin	25
IFrameQuantFactor	0.71
InLoopDeblockingFilterAlpha	0
InLoopDeblockingFilterBeta	0
Level	12
MotionEstimationMethod	7
MotionEstimationRange	16
MotionEstimationSubPelQuality	7
MotionEstimationSubPixelComparison	0
NoiseReduction	0
QuantizerMax	51
QuantizerMaxDiffBetweenFrames	4
QuantizerMin	10
QuantizerScaleBlurOverTime	0.5
QuantizerScaleCompress	0.6
ReferenceFrames	2
SceneChangeDetectThreshold	45
TrellisRDQuantization	0

You can change the default settings according to the type of video you are streaming in constant bit rate (CBR), mobile, or variable bit rate (VBR):

- CBR - Newscast
- CBR - Sports
- CBR - Action
- Mobile
- VBR – Newscast
- VBR – Sports
- VBR - Action

CBR – Newscast

Newscast type content has low motion and some scene changes.

Setting	Value
BFramesBias	0
BFramesMax	0
BFramesStrategy	0
BitRateTolerance	1
BlurComplexity	20
ChromaOffset	0
CodecFlags	41496352
CodecFlags2	131328
CoderType	0
DirectMVPrediction	1
GOPSize	300
GOPSizeMin	30
IFrameQuantFactor	0.71
InLoopDeblockingFilterAlpha	0
InLoopDeblockingFilterBeta	0
Level	12
MotionEstimationMethod	7
MotionEstimationRange	8
MotionEstimationSubPelQuality	7
NoiseReduction	0
QuantizerMax	51
QuantizerMaxDiffBetweenFrames	16
QuantizerMin	12
QuantizerScaleBlueOverTime	0.5
QuantizerScaleCompress	0.3
ReferenceFrames	6
SceneChangeDetectThreshold	45
TrellisRDQuantization	0

CBR – Sports

A sports event sequence is a typical representation of a sports game.

Setting	Value
BFramesBias	0
BFramesMax	0
BFramesStrategy	0
BitRateTolerance	1
BlurComplexity	20
ChromaOffset	0
CodecFlags	4196352
CodecFlags2	131328
CoderType	0
DirectMVPrediction	1
GOPSize	400
GOPSizeMin	40
InLoopDeblockingFilterAlpha	1
InLoopDeblockingFilterBeta	1
Level	12
MotionEstimationMethod	7
MotionEstimationRange	8
MotionEstimationSubPelQuality	7
MotionEstimationSubPixelComparison	0
NoiseReduction	0
QuantizerMax	51
QuantizerMaxDiffBetweenFrames	16
QuantizerMin	10
QuantizerScaleBlurOverTime	0.5
QuantizerScaleCompress	0.5
ReferenceFrames	6
SceneChangeDetectThreshold	55
TrellisRDQuantization	0

CBR – Action

An action movie sequence has a lot of lasers, explosions, bright lights flickering, dust, and scene changes.

Setting	Value
BFramesBias	0
BFramesMax	0
BFramesStrategy	0
BitRateTolerance	1
BlurComplexity	20
ChromaOffset	0
CodecFlags	4196352
CodecFlags2	131328
CoderType	0
DirectMVPrediction	1
GOPSize	350
GOPSizeMin	35
IFrameQuantFactor	-0.8
InLoopDeblockingFilterAlpha	2
InLoopDeblockingFilterBeta	1
Level	12
MotionEstimationMethod	7
MotionEstimationRange	8
MotionEstimationSubPelQuality	7
MotionEstimationSubPixelComparison	0
NoiseReduction	0
QuantizerMax	51
QuantizerMaxDiffBetweenFrames	8
QuantizerMin	10
QuantizerScaleBlurOverTime	0.5
QuantizerScaleCompress	0.6
ReferenceFrames	6
SceneChangeDetectThreshold	45
TrellisRDQuantization	0

Mobile

Setting	Value
BFramesBias	0
BFramesMax	0
BFramesStrategy	0
BitRateTolerance	1
BlurComplexity	20
ChromaOffset	0
CodecFlags	4196352
CodecFlags2	131328
CoderType	0
DirectMVPrediction	1
GOPSize	300
GOPSizeMin	30
IFrameQuantFactor	-0.71
InLoopDeblockingFilterAlpha	2
InLoopDeblockingFilterBeta	1
Level	11
MotionEstimationMethod	7
MotionEstimationRange	8
MotionEstimationSubPelQuality	7
MotionEstimationSubPixelComparison	0
NoiseReduction	0
QuantizerMax	51
QuantizerMaxDiffBetweenFrames	16
QuantizerMin	10
QuantizerScaleBlurOverTime	0.5
QuantizerScaleCompress	0.3
ReferenceFrames	2
SceneChangeDetectThreshold	50
TrellisRDQuantization	0

VBR – Newscast

Setting	Value
BFramesBias	0
BFramesMax	0
BFramesStrategy	0
BitRateTolerance	1
BlurComplexity	20
ChromaOffset	0
CodecFlags	4196352
CodecFlags2	131328
CoderType	0
ConstantRateFactor	22
DirectMVPrediction	1
GOPSize	300
GOPSizeMin	25
IFrameQuantFactor	0.71
InLoopDeblockingFilterAlpha	-1
InLoopDeblockingFilterBeta	-1
Level	12
MotionEstimationMethod	7
MotionEstimationRange	16
MotionEstimationSubPelQuality	8
MotionEstimationSubPixelComparison	0
NoiseReduction	0
QuantizerMax	51
QuantizerMaxDiffBetweenFrames	4
QuantizerMin	12
QuantizerScaleBlurOverTime	0.5
QuantizerScaleCompress	0.6
ReferenceFrames	6
SceneChangeDetectThreshold	45
TrellisRDQuantization	0

VBR – Sports

Setting	Value
BFramesBias	0
BFramesMax	0
BFramesStrategy	0
BitRateTolerance	1
BlurComplexity	20
ChromaOffset	0
CodecFlags	4196352
CodecFlags2	131328
CoderType	0
ConstantRateFactor	22
DirectMVPrediction	1
GOPSize	250
GOPSizeMin	25
IFrameQuantFactor	-0.8
InLoopDeblockingFilterAlpha	1
InLoopDeblockingFilterBeta	1
Level	12
MotionEstimationMethod	7
MotionEstimationRange	16
MotionEstimationSubPelQuality	8
MotionEstimationSubPixelComparison	0
NoiseReduction	0
QuantizerMax	51
QuantizerMaxDiffBetweenFrames	4
QuantizerMin	10
QuantizerScaleBlurOverTime	0.5
QuantizerScaleCompress	0.6
ReferenceFrames	6
SceneChangeDetectThreshold	65
TrellisRDQuantization	0

VBR – Action

Setting	Value
BFramesBias	0
BFramesMax	0
BFramesStrategy	0
BitRateTolerance	1
BlurComplexity	20
ChromaOffset	0
CodecFlags	4196352
CodecFlags2	131328
CoderType	0
ConstantRateFactor	22
DirectMVPrediction	1
GOPSize	300
GOPSizeMin	30
IFrameQuantFactor	-0.71
InLoopDeblockingFilterAlpha	1
InLoopDeblockingFilterBeta	0
Level	12
MotionEstimationMethod	7
MotionEstimationRange	16
MotionEstimationSubPelQuality	8
MotionEstimationSubPixelComparison	0
NoiseReduction	0
QuantizerMax	51
QuantizerMaxDiffBetweenFrames	4
QuantizerMin	10
QuantizerScaleBlurOverTime	0.5
QuantizerScaleCompress	0.6
ReferenceFrames	4
SceneChangeDetectThreshold	85
TrellisRDQuantization	0

Settings

Setting	Explanation
BitRateTolerance	Setting the bit rate tolerance tells the encoder it must hit the target bit rate almost exactly. However, this value can have an adverse effect on quality because you are forcing the encoder to stay at a target bit rate. More heavy frames may not get enough bits to make the image look better while less heavy frames get more than they need. As a result, the quality may vary. If you set the value to **1**, the encoder uses 0.01.
DirectMVPrediction	The default setting is **temporal**. Temporal breaks when b-pyramid is applied. As a result, it is easy to mix the two improperly. **Spatial** is a better default.
GOPSize	This value sets the maximum interval between IDR frames. Theoretically, higher values improve compression because IDR frames are the heaviest, but it can also reduce the appearance of fluctuating quality.
GOPSizeMin	This value sets the minimum length between IDR frames. This setting limits the minimum length after each IDR frame before another can be placed.
InLoopDeblockingFilterAlpha	This value affects the overall amount of deblocking applied to the picture. Higher values deblock more efficiently, but retain less detail causing the image to appear softened. The default value is **0** and should be sufficient to eliminate most blocking, but it leaves the picture noticeably blurrier. In general, values should be no lower than **-3** and no higher than **3**. This value is the most important parameter in determining the overall sharpness of your encode.
InLoopDeblockingFilterBeta	This value determines whether something in a block is a detail or not when deblocking is applied to it. Lower values apply less deblocking to more flat blocks with detail present and more deblocking to blocks without detail. Higher values cause more deblocking to be applied to less flat blocks with details present. Raising the value of Beta deblocking is a good way to get rid of ringing artifacts by applying more aggressive filtering to blocks that aren't very flat. Lowering the value of Beta deblocking is a good way to reduce the amount of DCT blocks without blurring the entire picture.
MotionEstimationMethod	This value sets the quality. It determines the motion detection method (5 is dia, 7 is hex, 8 is umh, 2 is esa, 10 is teas). Because teas (10) is not really achievable in real time encoding there is no reason to use it. **dia** – (diamond) is the simplest search. It starts at the best predictor, checks the motion vectors at one pixel upwards, left, down, and to the right, chooses the best, and repeats the process until it no longer finds any better motion vectors. This

Setting	Explanation
	setting is the fastest. **hex** – (hexagon) is the default setting. It uses a similar strategy to dia, except it uses a range-2 search of 6 surrounding points. It is considerably more efficient than dia and hardly any slower. This setting is a good choice for general use. **umh** – (uneven multi-hex) is considerably slower than hex. It searches a complex multi-hexagon pattern to avoid missing harder-to-find motion vectors. umh is about 40 % slower than hex. **esa** – (exhaustive) is a highly optimized intelligent search of the entire motion search space within range of the best predictor. It is the mathematically equivalent to the brute force method of searching every single motion vector in that area, though faster. It is still considerably slower than umh. **teas** – (transformed exhaustive) attempts to approximate the effect of running a Hadamard transform comparison at each motion vector. It's a little bit better than esa but a little bit slower, too slow for practical use.
MotionEstimationRange	This value controls the maximum range of the motion search. For hex and dia, the encoder only uses between 4 and 16. umh and esa allow you to increase past 16 to allow a wider range of motion search, which is useful for high-definition footage and for high-motion footage. Increasing MotionEstimationRange significantly slows down encoding.
MotionEstimationSubPelQuality	This value controls the subpixel motion estimation quality. Higher numbers are better. Levels **1** through **5** simply control the subpixel refinement strength. Level **6** enables RDO for mode decision, and level **8** enables RDO for motion vectors and intra prediction modes. RDO levels are significantly slower than the previous levels. 0 — fullpel only (not recommended) 1 — QPel SAD 1 iteration 2 — QPel SATD 2 iterations 3 — HPel on MB then QPel 4 — Always QPel 5 — Multi QPel + bime 6 — RD on I/P frames 7 — RD on all frames 8 — RD refinement on I/P frames 9 — RD refinement on all frames 10 — QP-RD (requires trellis=2, aq-mode >0)
QuantizerMax	The default setting is **31**. This value sets the maximum for the quantizer. **51** is the highest quantizer available for use in the H.264 specification and is very low quality. *IMPORTANT! For low bit rates you want to keep constant, it is*

Setting	Explanation
	recommended that you use the default setting of 51 and not 31.
QuantizerMaxDiffBetweenFrames	This value determines the maximum change quantizer between two frames. The purpose is to reduce the possibility of any large quality jumps in the output video. It is better to slow this change over a few frames rather than all at once. **4** is good, however if you don't want to see big jumps in bit rates and don't mind big jumps in quality, you can increase the value to **8** or **16**.
QuantizerMin	This value sets the minimum quantizer you will ever use. The lower the quantizer the closer it is to its input. For most video, anything below 10 is perceptually lossless. Anything below the default of 8 is definitely lossless. *IMPORTANT! Raising gpmin higher than its default of 16 is strongly discouraged because this could reduce the quality of flat background areas of the frame.*
QuantizerScaleCompress	The default setting is **0.60**. Use this value to trade off the number of bits allocated to "expensive" high-motion versus "cheap" low-motion frames. At one extreme, a setting of **0.0** aims for true constant bit rates. Typically with high-motion scenes, this setting tends to look bad. If you use low bit rates, however, low motion scenes appear perfect but use more bits than needed. The other extreme setting of **1.0** aims to achieve constant quantization, however this setting throws many bits at high-motion scenes, and a lot less at low-motion scenes which can cause the bit rate to fluctuate. **0.50** performs well on sports, **0.60** on action content, while **0.30** works well with news broadcasts. **0.2** works well with drama-type movies, soap operas, and shows.
ReferenceFrames	This value is the number of previous frames each P-frame can use as a reference. Recommended value is around **4** to **8**. Each increase has reduced benefit and constant speed loss with higher CPU usage. However, **16** can be helpful for animated content, video game capture, CGI, and other similar content.
SceneChangeDetectThreshold	**0** turns off scene change detection. Higher values of scenecut increase the number of scenecuts detected. A good default is **40**. *IMPORTANT! Lowering the default causes less scene detections so it would use less IDR frames. Those are expensive heavyweight frames.*

Other settings

Setting	Explanation
BlurComplexity	Apply a Gaussian blur with the given radius to the quantizer curve. This value means the quantizer assigned to each frame is blurred temporally with its neighbors to limit quantizer fluctuations.
BQuantFactor	This value sets the targets average reduction in bit rate for B-frames as compared to P-frames. Higher values increase the quality of B-frames. This value makes them better references, which can improve the overall image quality. The problem is that the extra bits taken by the B-frames are taken from the P-frames, which makes this variable a balancing act.
BQuantOffset	This value is the quantizer scale offset between I-P-B-frames.
ChromaOffset	The encoder normally encodes all 3 color planes (luma, U (chroma), V (chroma)) at the same quantizer. The system adds this value to the quantizers for the U and V planes. This value allows you to bias the encode in favor of brightness (luma) by setting positive values (chroma fields will have higher quantizers), or in favor of color (chroma) by setting negative values (chroma fields will have lower quantizers). The encoder only encodes the luma and chroma planes at the quantizer up to quantizer 29. After this, chroma is progressively quantized by a lower amount than luma until you end with luma at quantizer 51. This behavior is not adjustable, as it is required by the H.264 standard.
ConstantQuantizationRateControl	This value sets the encoder to use Constant Quantization Rate Control. It keeps the encoding at a constant quantizer and doesn't restrict to target a certain bit rate, but rather restricts to a certain quality no matter what bit rate it needs to use on each frame to keep quality constant. This value is mostly for quality encodes, set to **-1** to disable this encode mode.
Level	This value sets the level flag in the output bit stream (as defined by Annex A of the H.264 Standard) permissible levels include: 1, 1.1, 1.2, 1.3, 2, 2.1, 2.2, 3, 3.1, 3.2, 4, 4.1, 4.2, 5, and 5.1 The encoder does not support level 1b from the specification.
MaxBFramesBetweenNonBFrames	This value sets the maximum number of concurrent B-frames that can be used. B-frames are similar to P-frames, except they can use motion prediction from future frames as well. This value can lead to significantly better efficiency in terms of compression ratio.
NoiseReduction	This value performs adaptive pseudo-dead zone noise reduction, estimates film noise based on the value set and attempts to remove the noise by dropping small details before

Setting	Explanation
	quantization. (100 to 1000 for de-noising)
TrellisRDQuantization	This value performs Trellis quantization to increase efficiency. **0** = No quantization **1** = Quantization on final macroblock **2** = Always quantize This value requires CABAC.

Appendix C: Mapped Network Drive Setup

Setting up the network drive for the Niagara 4100 to export files, requires setting up two administrator accounts on a remote PC where the shared folder will be located:

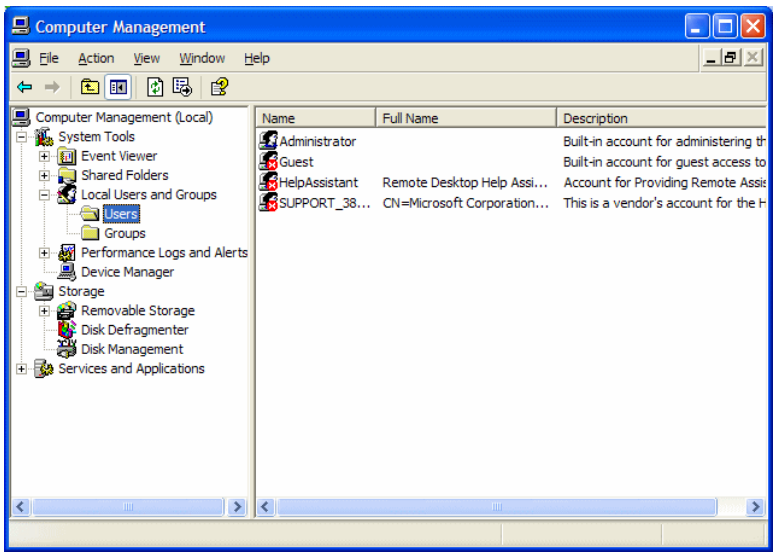
- One account for the username N4100
- One account for the username SCXUser

The shared folder is created on the remote PC with full access for both Niagara 4100 and SCXUser. On the Niagara 4100, the mapped network drive is created to reconnect at logon using the SCXUser username.

To set up user accounts on a remote PC:

1. Click on **Start** ➢ **Control Panel**.
2. Double-click on **Administrative Tools**.
3. Double-click on **Computer Management**.
4. Expand Local Users and Groups. Click on **Users**.

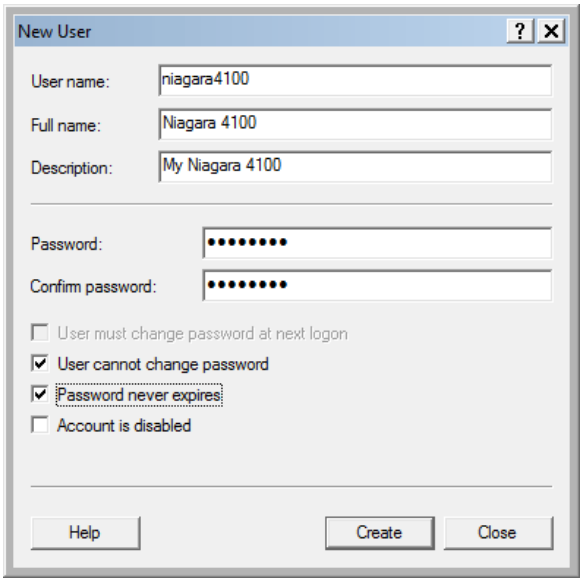
   Figure 137. Users



5. Under **Action**, select **New User**.
6. Enter **niagara4100** for the **User name**.
7. **Full name** and **Description** are optional.
8. Enter **viewcast** for the **Password**.

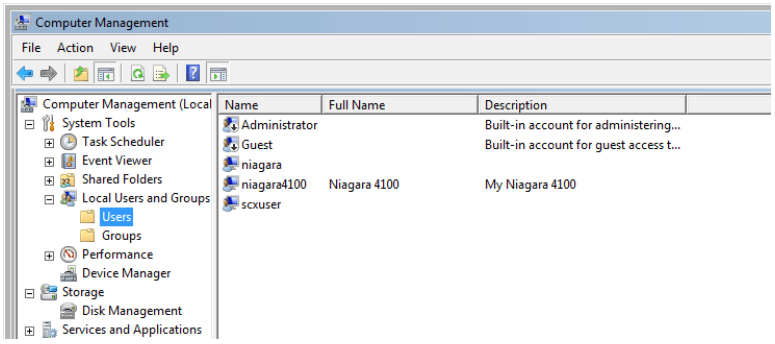
9. Enter **viewcast** for the **Confirm password.**
10. Disable **User must change password at next logon**.
11. Enable **User cannot change password**.
12. Enable **Password never expires**.

Figure 138. New User window



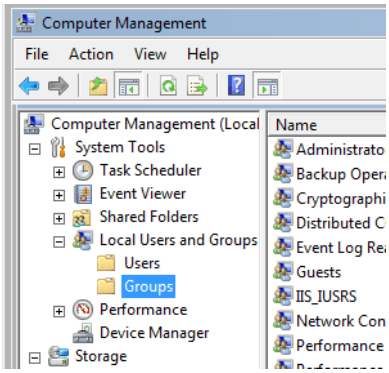
13. Click **Create**.
14. Repeat steps 5 through 13 to create the user **SCXUser** using the password **viewcast**.
15. Click **Close**.
16. The two new users appear in the users list.

Figure 139. Added Users



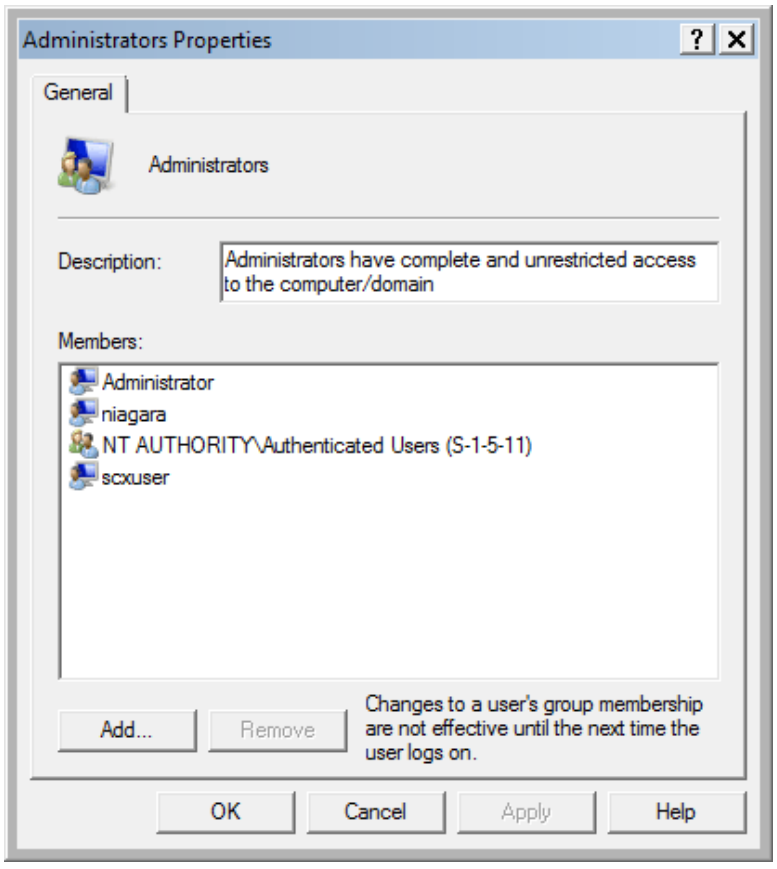
17. In Computer Management, click **Groups**.

Figure 140. Groups



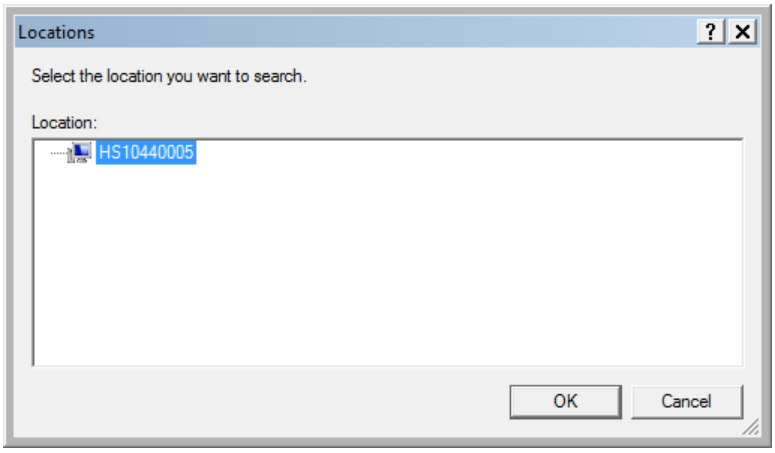
18. Double-click on **Administrators**.
19. Click **Add**.

Figure 141. Administrators Properties window



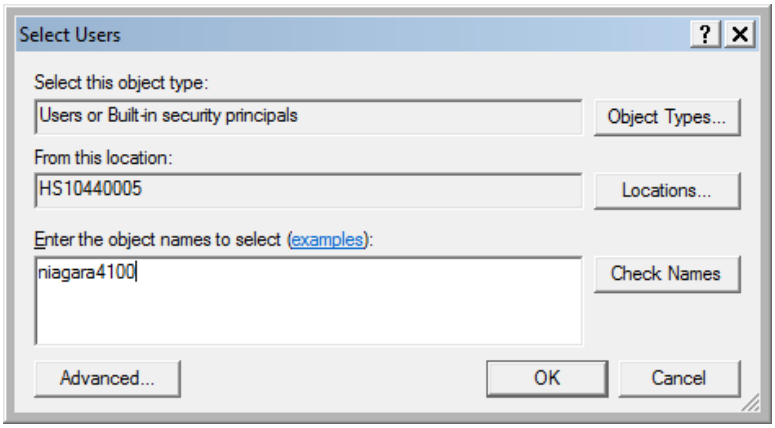
20. Click **Add**. The Select Users window displays.
21. Click **Locations**.
22. Select the PC, then click **OK**.

Figure 142. Locations window



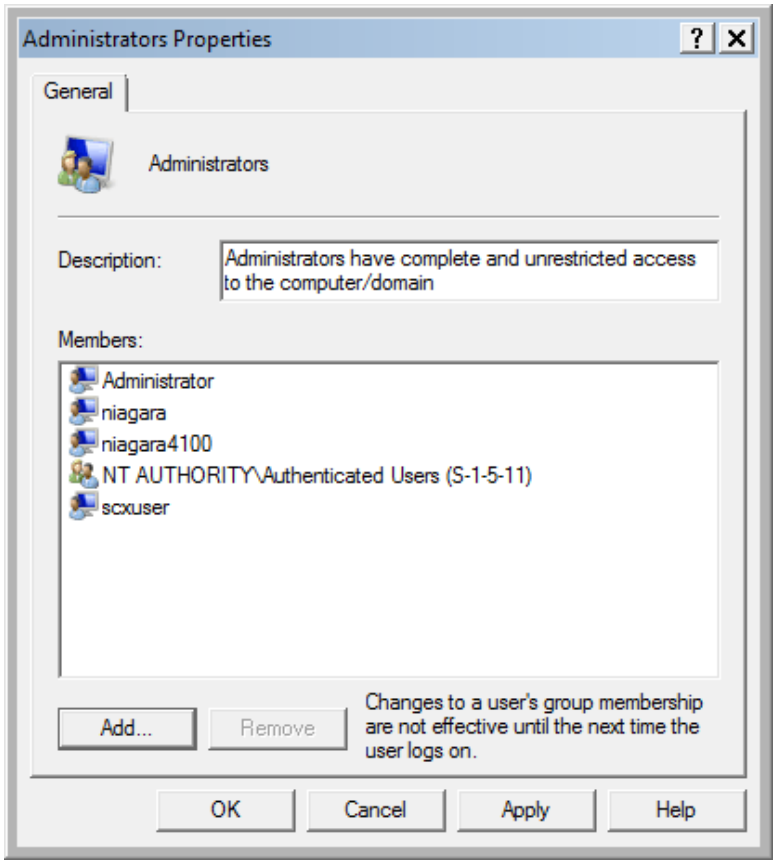
23. Enter **niagara4100** for the object name, then click **OK**.

Figure 143. Select Users window



24. The user **niagara4100** appears in the list of Administrators.

Figure 144. Administrator Properties



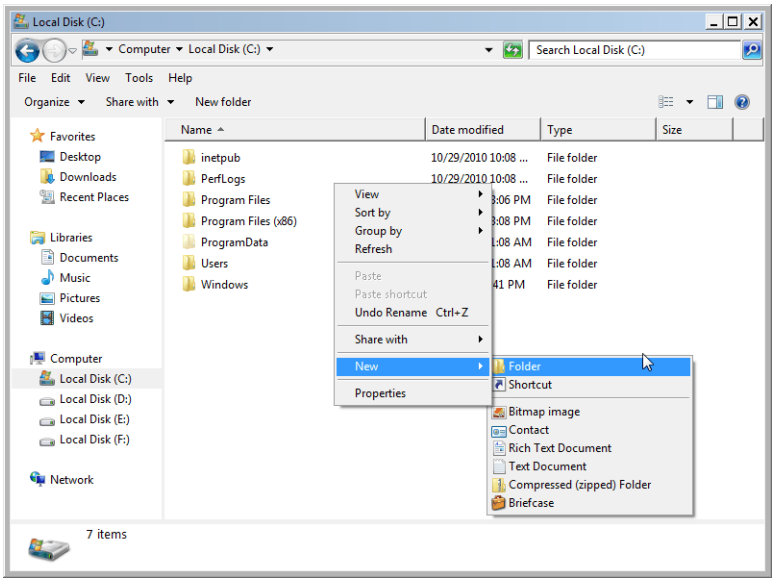
25. Repeast steps 19 through 22 to add SCXUser as an administrator.

To create the shared folder:

Note: The shared folder(s) must be created on the remote PC.

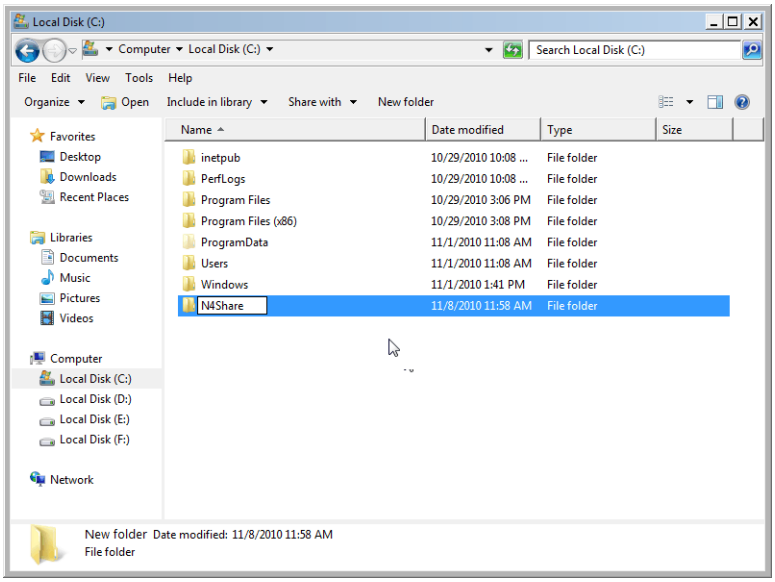
1. Open **My Computer**.
2. Open the drive where the shared folder will be created.
3. Right click, select **New**, then **Folder**.

Figure 145. Create new folder



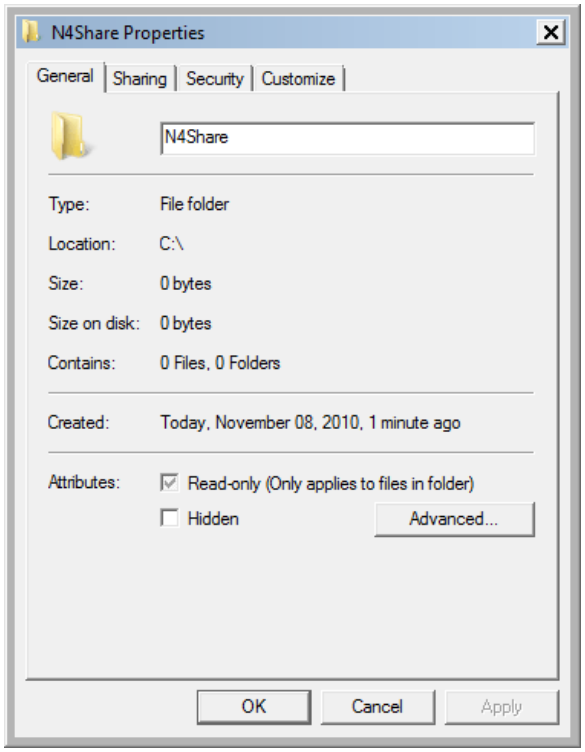
4. Enter a name for the folder (for example, N4Share).

Figure 146. Folder name



5. Right click on the folder, then select **Properties**.

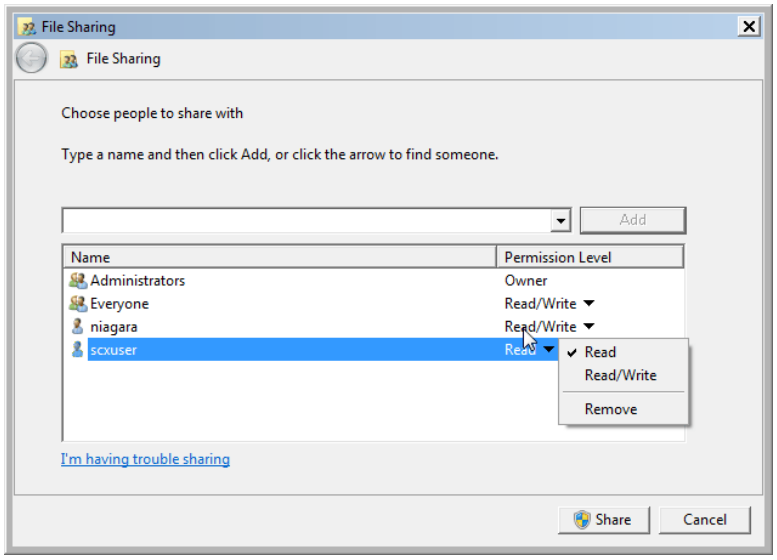
Figure 147. Folder Properties window



6. Click on the **Sharing** tab.
7. Click **Share**. The File Sharing window displays.
8. Type a name and then click **Add**, or click the arrow to select someone from the drop-down list.

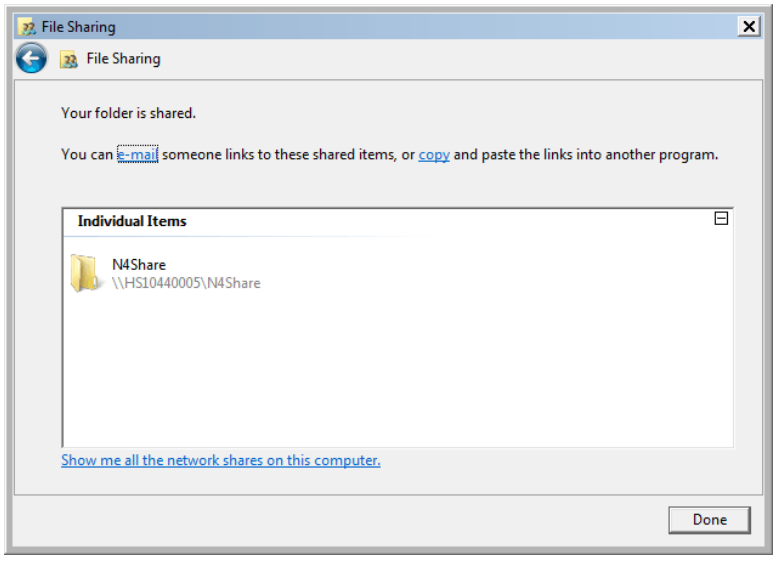
9. Use the drop-down list under permission level for this user and select Read/Write.

Figure 148. Read/Write permissions



10. Click **Share**.
11. Repeat steps 2 through 9 to add SCXUser to the Share Permissions.
12. Click **Done**.

Figure 149. File Sharing window



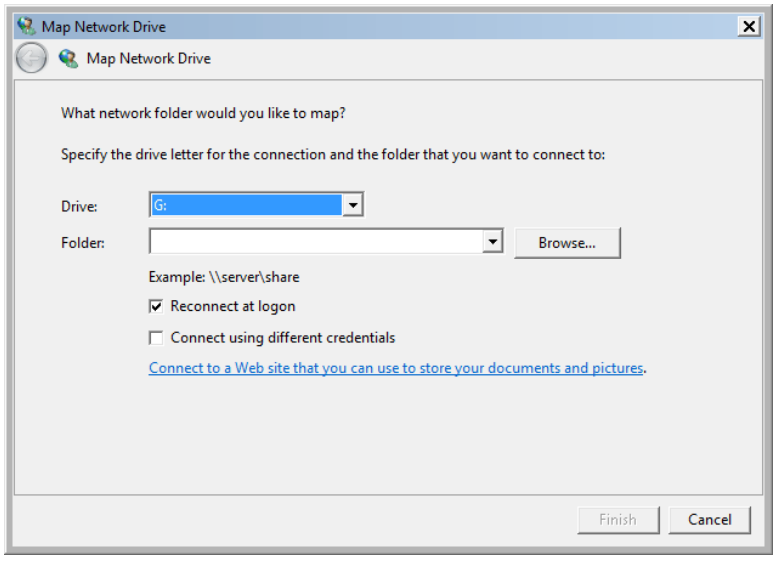
13. Click **Close** to close the share properties.

To map the network drive:

Note: Create a mapped network drive to the remote shared folder that will reconnect at logon. Once the mapped drive is created and the Niagara 4100 is rebooted, the user will be able to export to the network drive.

1. On the Niagara 4100, open **My Computer**.
2. Under **Tools**, select **Map Network Drive**.
3. Select a drive.

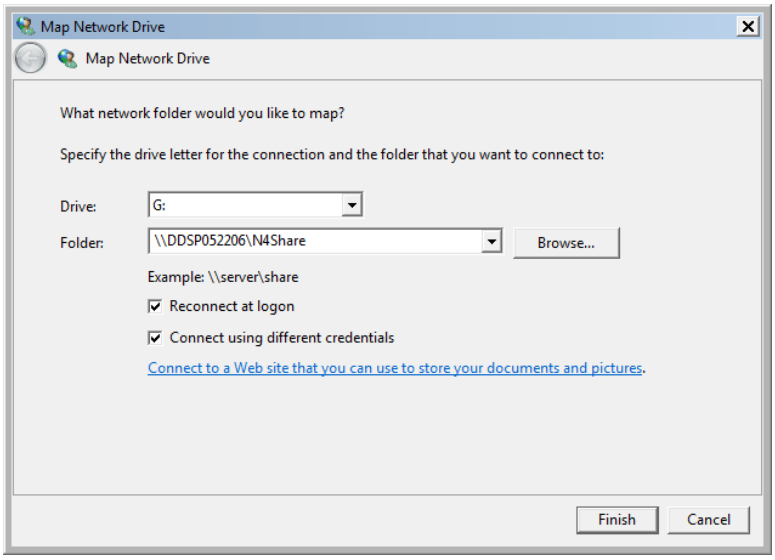
Figure 150. Map Network Drive window



4. In the text box for folder, enter the network path to the shared folder on the remote PC (for example, \\DDSP052206\N4Share).
5. Make sure **Reconnect at logon** is enabled.
6. Enable **Connect using different credentials**.

7. Click **Finish**.

Figure 151. Map Network Drive window



8. Enter **SCXUser** as the **User name** and **viewcast** as the **Password**.
9. Click **OK**.
10. Click **Finish**. After a few moments, the network share will open.
11. Close the window. The mapped drive will now appear inMy Computer under Network Drives.
12. Reboot the Niagara 4100.

Appendix D: EASE Menu

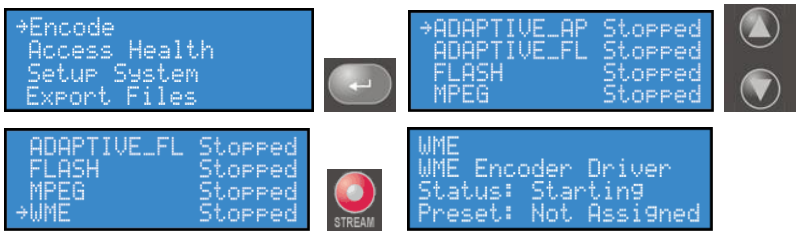
This section provides the detail of the *LCD menu tree*. It is intended to be a complete reference to all levels and functions accessible using the Niagara 4100 front panel LCD display.

It is designed to be a visual reference of the LCD screen including the front panel button action to move to the next screen.

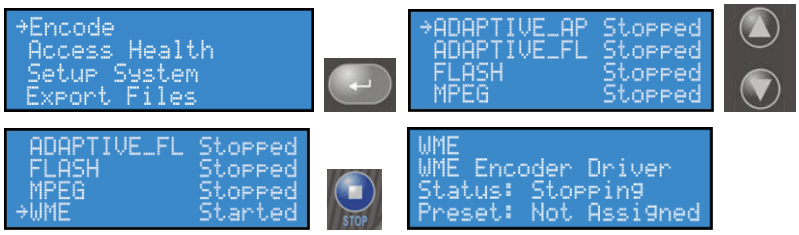
Button	Action
	Power on
	Access Menu/Return to Previous
	Enter/Execute Command
	Mover Pointer Up/Down
	Start Encoder
	Stop Encoder

Encoder menu

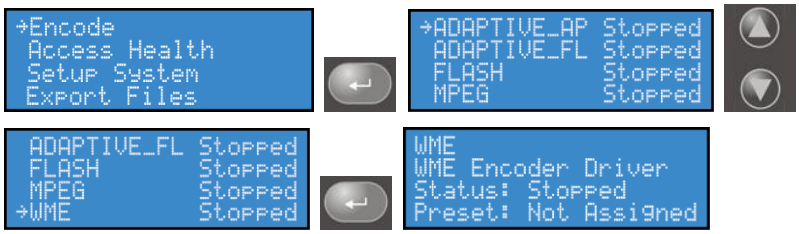
Encoder start



Encoder stop

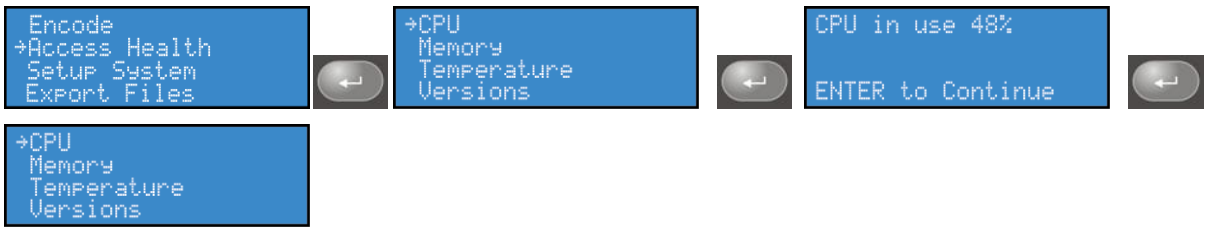


Encoder status

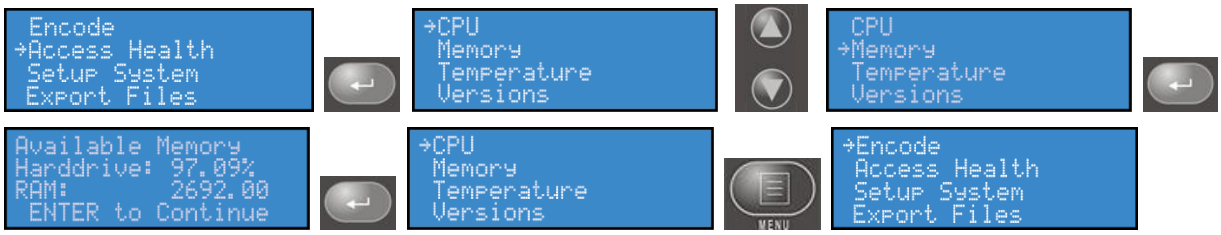


Access Health menu

CPU status

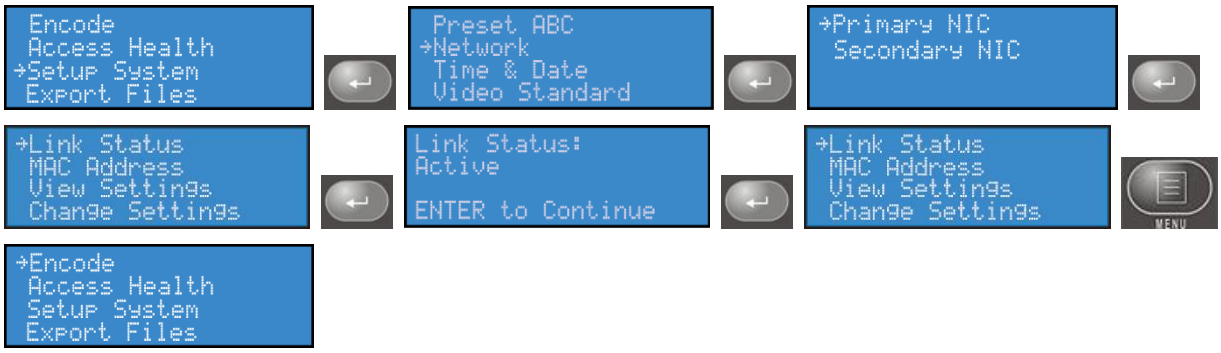


Memory available

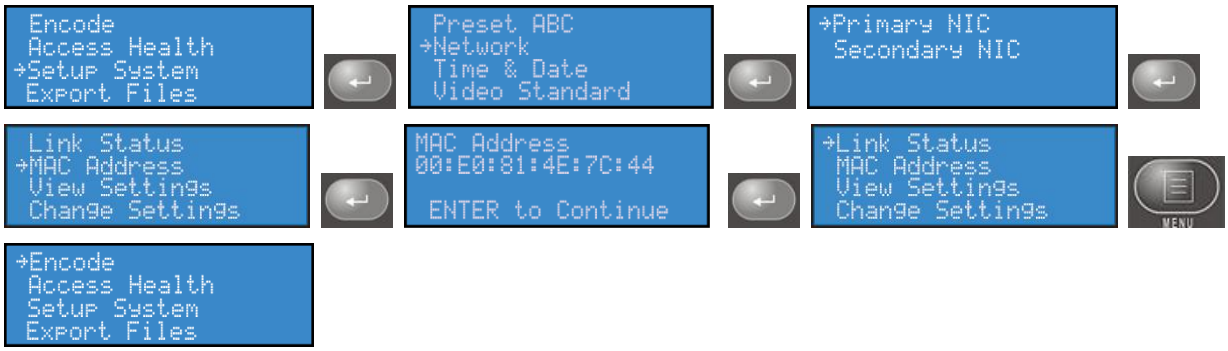


Setup system menu

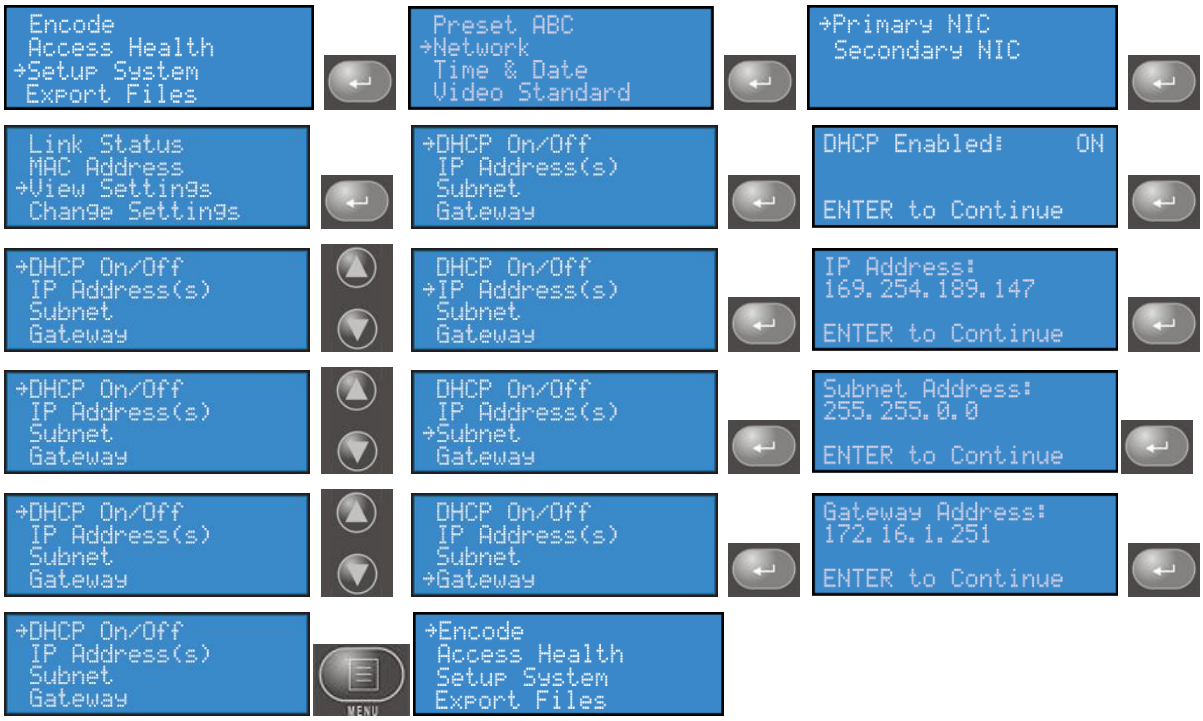
Network link status



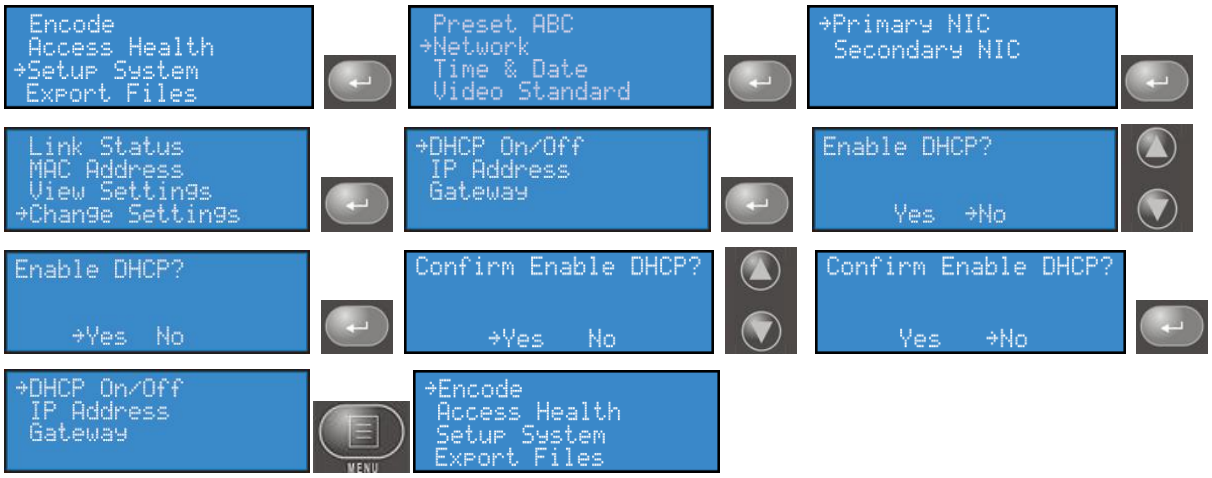
Network MAC address



View network settings



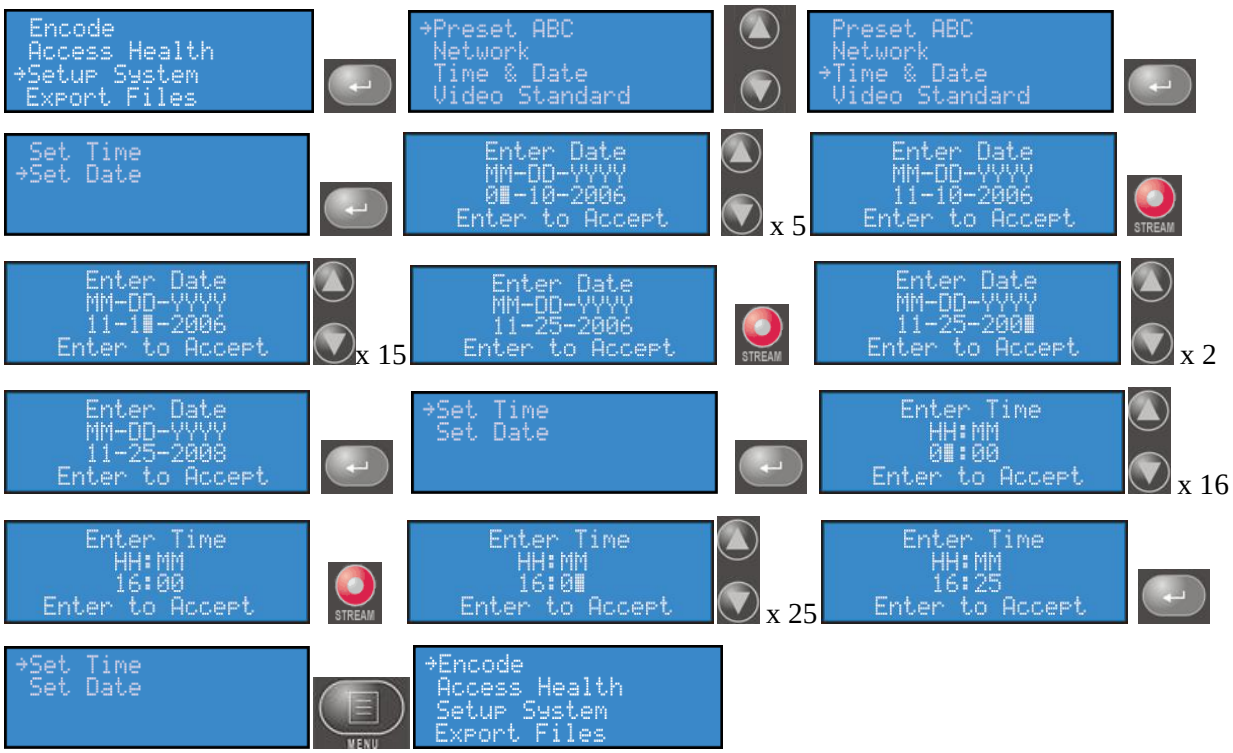
Enable DHCP



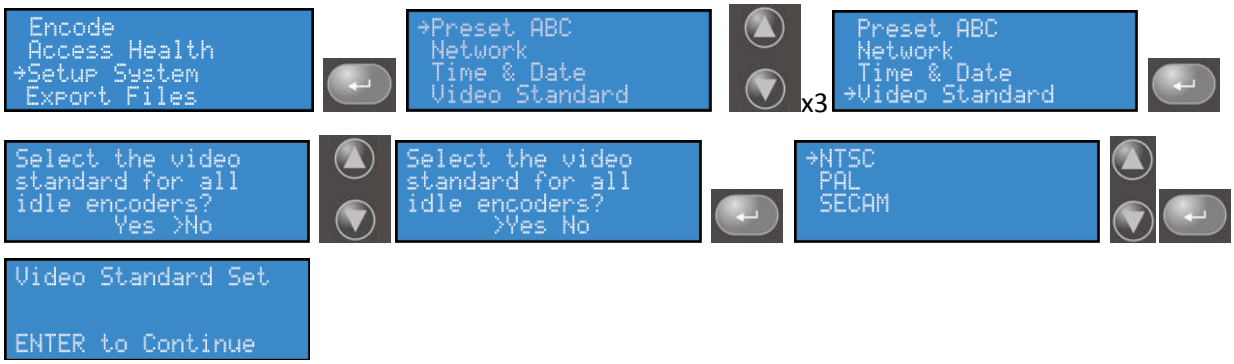
Set static IP addresses

Set gateway address

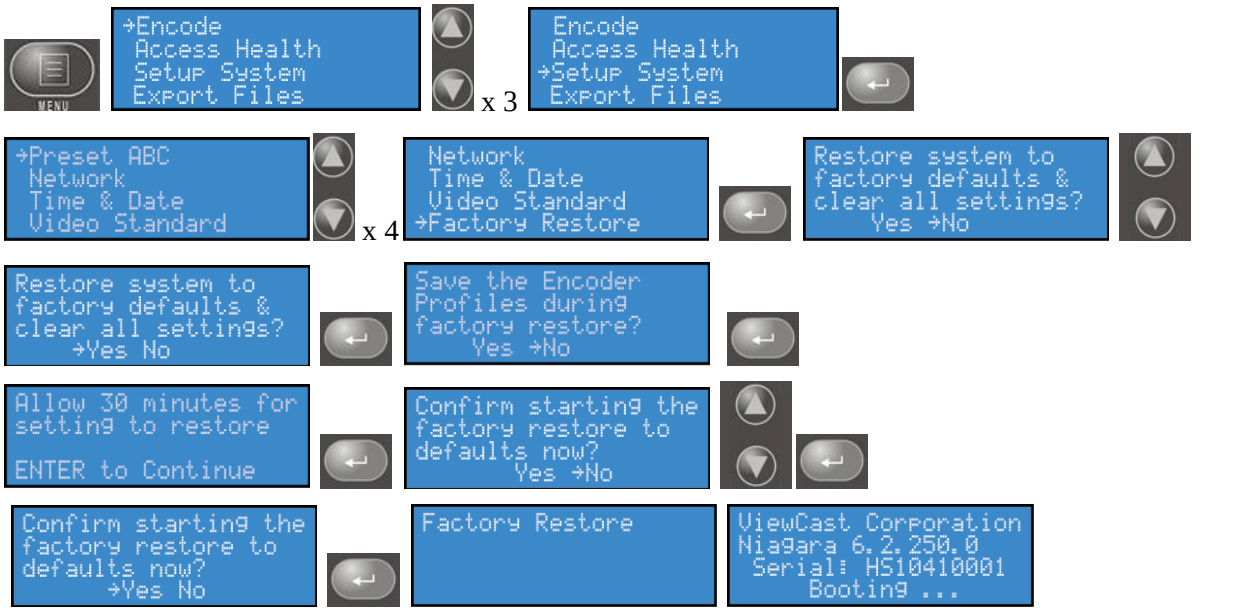
Set date and time



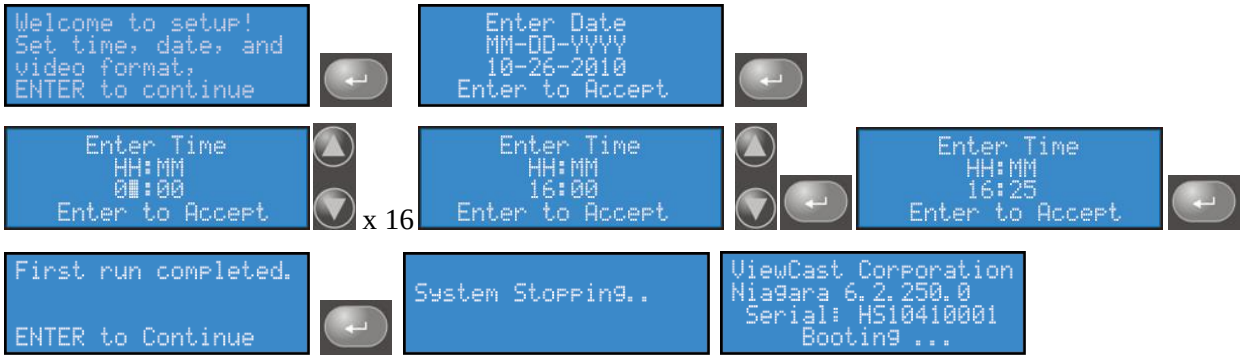
Set video standard



Factory restore

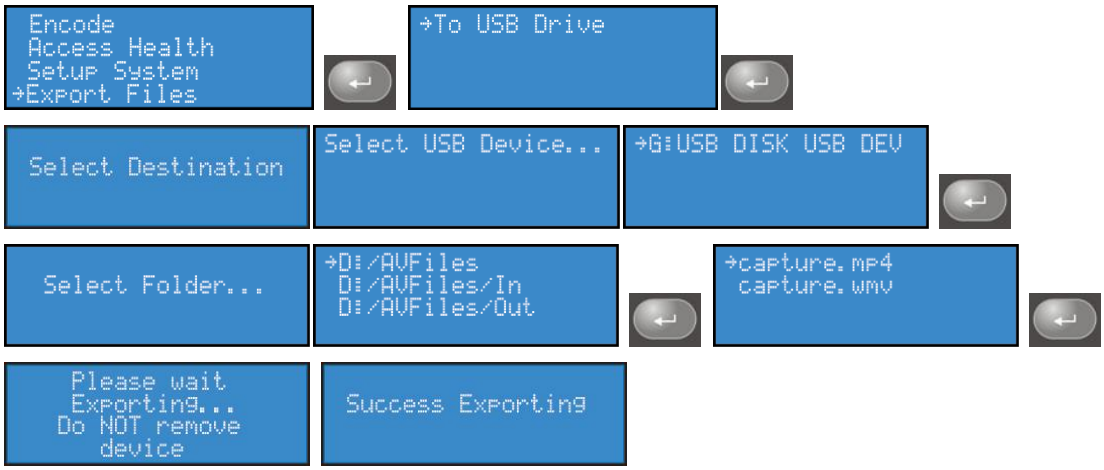


Note: This process actually takes ~10 minutes, be patient.

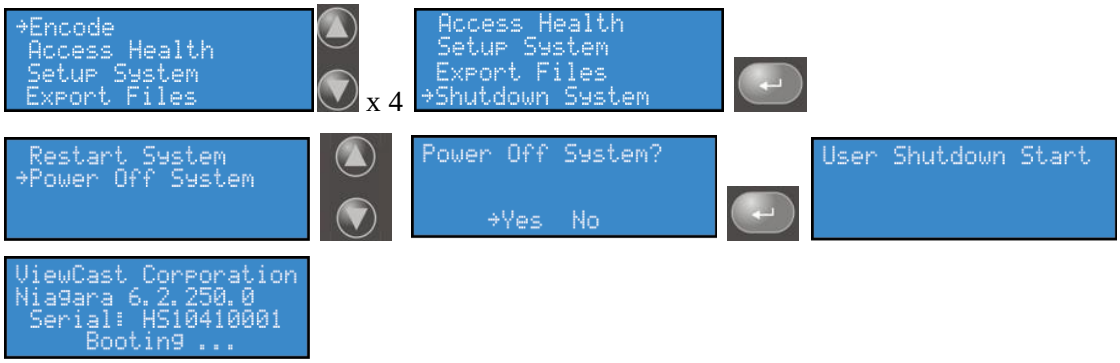


Export files menu

Export to USB drive



Shutdown Niagara 4100



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